

**Abstract Education**<br> **Abstract : The Equivalence Classes of Counting**<br> **Abstract : In this paper, we discuss the**<br> **Abstract : In this paper, we discuss the**<br> **Abstract : In this paper, we discuss the**<br> **Abstract : In thi Alternational Conference on Soci-**<br> **number of equivalence Classes of Counting**<br> **number of equivalence classes of Counting**<br> **number of equivalence** chiversity of California Irvine, Irvine, CA, L<br> **Abstract**: In this pap **Physical Science Classes of Counting**<br> **Physical Science Classes of Counting**<br> **permutational Currence Classes of Counting**<br> **Physical Science University of California Irvine, Irvine, (<br>
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Abstract : In this paper, we discuss the set to another finite set in Se<br>
number of equivale **general permutation subgroups to act on a** Finally, we give subset of Counting<br> **general permutation subgroups to act on a**<br> **general permutation subgroups to act on a** a mean of computation subgroups act of equivalence c **finite set consists of Counting**<br>**finite set consists of Counting**<br>**finite set consist of Physical Science University of California Irvine, Irvine, C<br><b>Abstract** : In this paper, we discuss the set to another finite set in **Example 12 and 12 and 12 and 13 and 14 and 15 and 15 and 16 mappings from a finite set to a finite set to another set to a finite set to a finite set in Section<br>
<b>Abstract** : In this paper, we discuss the set to another finite set in Sect<br>
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Schultzer Some Sulformia Irvine, Commutation subgroups are some some some some** School of Physical Science University of California Irvine, Irvine, C<br> **Abstract** : In this paper, we discuss the set to another finite set in Se<br>
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general permutation subgroups to act on a<br>
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Keywords: Equivalence Class; Permutation<br>
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Group; Group Action; Mappings From a<br>
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1. Introduction<br>
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the is an equivalence relations<br> certain permutation groups in a natural way. [4,<br>Chapter 37] gives four examples for the number<br>of equivalence classes of mappings. However,<br>they only discuss the casses of equivalence classes of all equivalence classes f Chapter 37] gives four examples for the number<br>of equivalence classes of mappings. However,<br>they only discuss the cases of equivalence<br>of all equivalence classes form a<br>relations induced by cyclic and dihedral<br>permutation of equivalence classes of mappings. However,<br>
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pai First, we review some basic facts of set theory.<br>For a nonempty set A, the number of elements in<br>A will be denoted by |A|. A equivalence relation<br>on A is a relation that holds between certain<br>pairs of A. We may write it a For a nonempty set A, the number of elements in<br>A will be denoted by |A|. A equivalence relation<br>on A is a relation that holds between certain<br>pairs of A. We may write it as a ~ b and speak of<br>it as equivalence of a and b A will be denoted by  $|A|$ . A equivalence relation<br>on A is a relation that holds between certain<br>pairs of A. We may write it as a ~ b and speak of<br>it as equivalence of a and b. An equivalence<br>relation is required to be:<br>•

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pairs of A. We may write it as a  $\sim$  b and speak of<br>it as equivalence of a and b. An equivalence<br>relation is required to be:<br>• reflexive: For all a  $\in$  A, a  $\sim$  a.<br>• symmetric: If a  $\sim$  b, then b  $\sim$  a.<br>• transitive: it as equivalence of a and b. An equivalence<br>relation is required to be:<br>
• reflexive: For all  $a \in A$ ,  $a \sim a$ .<br>
• symmetric: If  $a \sim b$ , then  $b \sim a$ .<br>
• transitive: If  $a \sim b$  and  $b \sim c$ , then  $a \sim c$ .<br>
Moreover, for any  $a \$ relation is required to be:<br>
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• symmetric: If  $a \sim b$ , then  $b \sim a$ .<br>
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Moreover, for any  $a \in A$ , the equivalence class<br>
of  $a \in A$  is defi • reflexive: For all  $a \in A$ ,  $a \sim a$ .<br>• symmetric: If  $a \sim b$ , then  $b \sim a$ .<br>• transitive: If  $a \sim b$  and  $b \sim c$ , then  $a \sim c$ .<br>Moreover, for any  $a \in A$ , the equivalence class<br>of  $a \in A$  is defined to be  $\{x \in A \mid x \sim a\}$ . Also, • symmetric: If  $a \sim b$ , then  $b \sim a$ .<br>• transitive: If  $a \sim b$  and  $b \sim c$ , then  $a \sim c$ .<br>Moreover, for any  $a \in A$ , the equivalence class<br>of  $a \in A$  is defined to be  $\{x \in A \mid x \sim a\}$ . Also,<br>a partition of A is a collection  $\{$ • transitive: If  $a \sim b$  and  $b \sim c$ , then  $a \sim c$ .<br>
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a partition of A is a collection  $\{Ai \le A \mid i \in I\}$ ,<br>
where I is an inde Moreover, for any  $a \in A$ , the equivalence class<br>
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where I is an indexing set and<br>  $\cdot A = \mathbf{u} \in \mathbf{I}\mathbf{A}$ ;<br>  $\cdot$  Ai of  $a \in A$  is defined to be  $\{x \in A \mid x \sim a\}$ . Also,<br>a partition of A is a collection  $\{Ai \le A \mid i \in I\}$ ,<br>where I is an indexing set and<br> $\cdot A = ui \in IAi$ ,<br> $\cdot Ai \cap Aj = 0$ , for all  $i,j \in I$  with  $i \ne j$ .<br>If  $\sim$  is an equivalence relatio a partition of A is a collection  $\{Ai \le A \mid i \in I\}$ ,<br>where I is an indexing set and<br> $\cdot A = ui \in IAi$ ,<br> $\cdot Ai \cap Aj = 0$ , for all  $i,j \in I$  with  $i \ne j$ .<br>If  $\sim$  is an equivalence relation on A, then the set<br>of all equivalence classes for a partitude of *F K* is a concedion  $\{X\} \supseteq X\}$  i.e. 4.  $\mathbf{A} = \mathbf{u} \in \mathbf{A}$  i.e.  $\mathbf{A} = \mathbf{u}$ • A = ui ∈ IAi,<br>• Ai ∩ Aj = 0, for all i,j ∈ I with i ≠ j.<br>• Ai ∩ Aj = 0, for all i,j ∈ I with i ≠ j.<br>If ~ is an equivalence relation on A, then the set<br>of all equivalence classes form a partition of A.<br>Conversely, for a • Ai  $\cap$  Aj  $= 0$ , for all  $i,j \in I$  with  $i \neq j$ .<br>
If  $\sim$  is an equivalence relation on A, then the set<br>
of all equivalence classes form a partition of A.<br>
Conversely, for any partition of A, the<br>
Corresponding equivalen For is an equivalence relation on A, then the set of all equivalence relation on A, then the set of all equivalence classes form a partition of A. Conversely, for any partition of A, the corresponding equivalence relation 2. The conversely, for any partition of A.<br>Conversely, for any partition of A, the corresponding equivalence relation is defined by the rule that  $a \sim b$  if a and b lie in the same subset of the partition.<br>Next, we introd Conversely, for any partition of A, the<br>corresponding equivalence relation is defined by<br>the rule that  $a \sim b$  if a and b lie in the same<br>subset of the partition.<br>Next, we introduce some concepts of groups. A<br>set G with a

corresponding equivalence relation is defined by<br>the rule that  $a \sim b$  if a and b lie in the same<br>subset of the partition.<br>Next, we introduce some concepts of groups. A<br>set G with a binary operation \* is called a **group**<br> the rule that  $a \sim b$  if a and b lie in the same<br>subset of the partition.<br>Next, we introduce some concepts of groups. A<br>set G with a binary operation \* is called a **group**<br>if the following conditions are satisfied:<br>1. The

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Moreover, a group is called abelian if the<br>
operation \* is commutative, i.e. a \* b = b \* a for<br>
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all a,b  $\in$  G. Also, the **order International Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **e.**<br> **a**(x1) ≠ a(x2) for :<br> **a**(x1) ≠ a(x2) for :<br> **a**(x1) ≠ a(x2) for :<br> **a**<br> **a**(x1) ≠ a(x2) for :<br> **a**<br> **a**<br> **a**(x1) ≠ a(x2) **International Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **e.**  $a(x1) \neq a(x2)$  then  $a(x1) \neq a(x2)$  then  $a(x1) \neq a(x2)$  then  $a(x1) \neq a(x2)$  to  $a(x1) \neq a(x2)$  to  $a(x1) \neq a(x2)$  to  $a(x1) \neq a(x2)$  to If {Hi : i <sup>∈</sup> I} is a nonempty family subgroups, e.<br>  $a(x1) \neq a(x2)$  for any x1,<br>
operation \* is commutative, i.e. a \* b = b \* a for<br>  $a(x1) \neq a(x2)$  for any x1,<br>  $b(x1) \neq b(x2)$  is a sumple  $a : X \rightarrow Y$  is surject<br>
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is defined as the number of elements in G. If  $|G|$  and only if a is surjective and  $\leq x$ 

all a,b ∈ G. Also, the **order** of G, denoted  $|G|$ , = y. A mapping a : X → Y is is defined as the number of elements in G. If  $|G|$  and only if a is surjective and in onempty subset H of G with binary operation \* permuta Is defined as the number of elements in G. If  $|G|$  and only if a is surjective and nonempty subset H of G with binary operation  $*$  is not true.<br>
is a subgroup of G if H is closed under products is a subgroup of G if H i actions. For a nonempty finite set A and a finite<br>and permutations. For any a,b  $\in$  H a  $\cdot$  if a  $\in$  H a  $\cdot$  if a  $\in$  H, a  $\cdot$  if a  $\in$ Solution of the group of G<br>
and inverses, that is,<br>  $\bullet$  for any a,b  $\in$  H, a  $\bullet$  b  $\in$  H, a  $\bullet$  Then Sr is a group whin<br>  $\bullet$  if  $a \in$  H, then a -1  $\in$  H,  $\bullet$  W,  $\bullet$  Then Sr is a group whin<br>  $\bullet$  if  $a \in$  H, then **a** for any a,b ∈ H, a<br> **a** for all  $x$  is a group where  $\cdot$  if a ∈ H, then  $\cdot$  i E H,  $\cdot$  if a ∈ H, then  $\cdot$  i E H.<br>
If {Hi: i ∈ I} is a nonempty family subgroups, and pairwise different element<br>
then  $\cap$  i ∈ IH i • io any  $a, b \in H$ ,  $a \cdot b \in H$ ,<br>• if  $a \in H$ , then  $a - 1 \in H$ .<br>If  $\{Hi : i \in I \}$  is a nonempty family subgroups,<br>then  $\bigcap i \in H$  is a subgroup of G. For any<br>nonempty subset K of G, let  $\{Hi : i \in I \}$  be the<br>family of all subgroups • Ta  $\in$  H, then a  $-1 \in$  H.<br>
tonempty sharply family subgroups,<br>
then  $\bigcap_{i \in H_i}$  is a subgroup of G. For any  $\in$  X, if<br>
nonempty subset K of G, let  $\{H_i : i \in I\}$  be the  $\pi(x) = x_i + 1, i = 1, 2, ..., x$ <br>
family of all subgroup If  $\{Hi : i \in I\}$  is a nonempty family sub<br>then  $\bigcap i \in Hi$  is a subgroup of G. F<br>nonempty subset K of G, let  $\{Hi : i \in I\}$ <br>family of all subgroups of G which con<br>Then  $\bigcap i \in Hii$  is called the subgroup<br>generated by the set

nonempty subset K of G, let {H<sub>1</sub> :  $1 \in 1$ } be the  $\pi$ (x1) - x1<sup>-1</sup>, 1 - 1, 2, ..., s<sup>5</sup><br>family of all subgroups of G which contain K.  $= x$ ,  $x \in X \setminus \{x\}$ ,  $x2$ ,..., xs<sup>3</sup><br>fhen  $\pi$ i  $\in \mathbb{H}$  is called the subgroup o tamily of all subgroups of G which contain K.  $-x$ ,  $x \in A$ <br>
Then  $\cap i \in IHI$  is called the subgroup of G then we call<br>
generated by the set K and denoted (K) denoted by<br>
Finally, we introduce some facts of group composition<br> generated by the set K and denoted (K)<br>
Finally, we introduce some facts of group<br>
remutation  $g \in Sr$  can be relations. For a nonempty finite set A and a finite<br>
group G, an action of the group G on the set A is<br>
a functi Finally, we introduce some facts of group<br>actions. For a nonempty finite set A and a finite<br>group G, an action of the group G on the set A is<br>group G, an action of the group G on the set A is<br>pairwise disjoint cyclic per<br>

actions. For a nonempty finite set A and a finite<br>group G, an action of the group G on the set A is<br>group G, an action of the group G on the set A is<br>for all in Section of the number of the set A is<br> $\frac{1}{2}$  and in Secti group G, an action of the group G on the set A is<br>
a function  $\phi : G \times A \rightarrow A$  satisfying the<br>
following conditions:<br>  $\cdot \phi(\epsilon, a) = a$  for all  $a \in A$ , where e is the identity<br>  $\cdot \phi(\epsilon a) = a$  for all  $a \in A$ , where e is the identity lemma following conditions:<br>  $\cdot \phi(e,a) = a$  for all  $a \in A$ , where e is the identity<br>  $\cdot \phi(g1, \phi(g2, a)) = \phi(g1g2, a)$  for all  $a \in A$  and<br>  $\cdot \phi(g1, \phi(g2, a)) = \phi(g1g2, a)$  for all  $a \in A$  and<br>  $\cdot \phi(g1, \phi(g2, a)) = \phi(g1g2, a)$  for all  $a \in A$  and<br>  $\cdot \$ •  $\phi$ (e,a) = a for all a  $\in$  A, where e is the identity<br>
of G.<br>
•  $\phi$ (gl,  $\phi$ (g2, a)) =  $\phi$ (glg2, a) for all a  $\in$  A and<br>
•  $\phi$ (gl,  $\phi$ (g2, a)) =  $\phi$ (glg2, a) for all a  $\in$  A and<br>
•  $\phi$  a binary<br>
gl, g2  $\in$  G. of G.<br>
• φ(g1,φ(g2, a)) = φ(g1g2, a) for all a ∈ A and<br>
• φ(g1,φ(g2, a)) = φ(g1g2, a) for all a ∈ A and<br>  $x = \pi$  i)  $\pi$  ii +  $\pi$  ii = 1, 2, ..., ..., ..., ... where the subsection of set A, then the subsection of the subsection of the subsection of  $\alpha$  is an equivalence relation on  $\alpha$  b if and only if  $a = \phi(g, b)$  for some  $g \in G$  Moreover, we call g is an Then the relation  $\sim$ **Example 1**<br> **Example 10** if a =  $\phi(g, a)$  for some  $g \in G$ <br> **Example 10** if a =  $\phi(g, b)$  for some  $g \in G$ <br> **Example 10** if a =  $\phi(g, b)$  for some  $g \in G$ <br> **Example 10** if a =  $\phi(g, b)$  for some  $g \in G$ <br> **Example 10** if a =  $\phi$ A. Therefore, the equivalence classes of  $\sim$  1<br>a partition of set A. As for the numb<br>equivalence classes of  $\sim$ , we have the follo<br>lemma<br>**Lemma 2.1** (Burnside's Lemma). Let G<br>finite group acting on a finite set A, the<br>n **Example 11**<br>
In this subsection, we formulate the our main<br>
In this subsection,

**Problem of Set The Set of the matter of the interest of**  $\sim$  **we have the following incompty subgroup H of Sramma 2.1 (Burnside's Lemma). Let G be a and**  $a \in M_{r,n}$ **, finite group action on a finite set A, then the and a \in** 

$$
\frac{1}{|G|} \sum_{g \in G} |Fix(g)|,
$$

Lemma 2.1 (Burnside's Lemma). Let G be<br>finite group acting on a finite set A, then t<br>number of equivalence classes of ~ is given by<br> $\frac{1}{|G|} \sum_{g \in G} |Fix(g)|$ ,<br>where  $Fix(g) = \{a \in A \mid \phi(g, a) = a\}$  is call<br>the set of fixed points o **Example 10**<br> **Example 2.1** (Burnside's Lemma). Let G be a and a  $\in M_{\rm T,n}$ ,  $M_{\rm T,n}$ , and<br>
finite group acting on a finite set A, then the  $(\phi(g, a))(x) = a(g(x)), \forall x \in X$ .<br>
Thus, we obtain a equivalence order or equivalence clas Finite group acting on a finite set A, then the<br>
finite group acting on a finite set A, then the<br>  $\frac{1}{|G|}\sum_{g\in G}|Fix(g)|$ ,  $\forall x \in \mathbb{X}$ <br>
number of equivalence classes of ~ is given by<br>  $\frac{1}{|G|}\sum_{g\in G}|Fix(g)|$ ,  $\Rightarrow$  Thus, we set of all mappings from X to Y as Fr,n. And the set of all types of  $X \rightarrow Y$  is injective if and only set of all mappings in Fr,n. A mapping a interval time subgroups for  $X \rightarrow Y$  is injective if and only  $X = Y$  is  $X \rightarrow Y$  is Fright the subset of  $\frac{1}{|G|} \sum_{g \in G} |Fix(g)|$ ,<br>  $\frac{1}{|G|} \sum_{g \in G} |Fix(g)|$ ,<br>
then the subset of fixed points of  $g \in G$ .<br>
2.2 Formulation<br>
In this subsection, we formulate the our main  $\frac{1}{|H|} \sum_{g \in H} |Fix(g)|$ ,<br>
2.2 Formulation specifier  $|\overline{G}| \sum_{g \in G} |x \cdot x(g)|$ ,<br>where  $\overline{Fix}(g) = \{a \in A \mid \phi(g, a) = a\}$  is called when the subgroup H acts on Mr<br>the set of **fixed points** of  $g \in G$ .<br>2.2 **Formulation**<br>the set of **fixed points** of  $g \in G$ .<br>2.2 **Formulation** When the subgroup H acts<br>
where Fix(g) = {a  $\in$  A |  $\phi$ (g, a) = a} is called<br>
the set of **fixed points** of  $g \in G$ .<br>
1.<br>
2.2 Formulation<br>
In this subsection, we formulate the our main  $\in$  X}. In the next see<br>
problem of

a(x1 )  $\neq$  a(x2 ) for any x1, x2 ∈ X. Also, a<br>mapping a : X → Y is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>= y. A mapping a : X → Y is a permutation if<br>and only if a is surjective and mapping a : X → Y is surjective if and only if **for each y** ∈ Y , then  $\sum_{x \in B}$  Academic Education<br>a(x1) ≠ a(x2) for any x1, x2 ∈ X. Also, a<br>mapping a : X → Y is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>= y. A mapping a : X → Y is Example The Academic Education<br>
a(x1) ≠ a(x2) for any x1, x2 ∈ X. Also, a<br>
mapping a : X → Y is surjective if and only if<br>
for each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>
= y. A mapping a : X → Y is a permutation if<br> **Andemic Education**<br>  $a(x1) \neq a(x2)$  for any  $x1$ ,  $x2 \in X$ . Also, a<br>
mapping  $a: X \rightarrow Y$  is surjective if and only if<br>
for each  $y \in Y$ , there is  $a \in X$  such that  $a(x)$ <br>  $= y$ . A mapping  $a: X \rightarrow Y$  is a permutation if<br>
and only if **Permutation**<br> **Permutatio i** Academic Educe<br>
a(x1)  $\neq$  a(x2) for any x1, x2  $\in$  X. Als<br>
mapping a : X  $\rightarrow$  Y is surjective if and on<br>
for each  $y \in Y$ , there is a  $x \in X$  such that<br>
= y. A mapping a : X  $\rightarrow$  Y is a permutation<br>
and only if a is **Example 18** and  $X = \sum_{n=1}^{\infty} P_n$  be the set of all permutation and  $X \rightarrow Y$  is surjective if and only if for each  $y \in Y$ , there is a  $x \in X$  such that  $a(x) = y$ . A mapping  $a : X \rightarrow Y$  is a permutation if and only if a is surje  $a(x1) \neq a(x2)$  for any  $x1$ ,  $x2 \in X$ . Also, a<br>mapping  $a : X \rightarrow Y$  is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that  $a(x)$ <br>= y. A mapping  $a : X \rightarrow Y$  is a permutation if<br>and only if a is surjective and inj **Example 18** and  $f(x) \neq a(x2)$  for any x1,  $x2 \in X$ . Also, a mapping  $a : X \rightarrow Y$  is surjective if and only if for each  $y \in Y$ , there is  $a x \in X$  such that  $a(x) = y$ . A mapping  $a : X \rightarrow Y$  is a permutation if and only if a is surjec **symmetric group** on the set X . For a π <sup>∈</sup> Sr a(x1)  $\neq$  a(x2) for any x1,  $x2 \in X$ . Also, a<br>mapping a :  $X \rightarrow Y$  is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>= y. A mapping a :  $X \rightarrow Y$  is a permutation if<br>and only if a is surjective an a(x1) ≠ a(x2) for any x1, x2 ∈ X. Also, a<br>mapping a : X → Y is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>= y. A mapping a : X → Y is a permutation if<br>and only if a is surjective and inje  $m$ mapping  $a: X \rightarrow Y$  is surjective if and only if<br>for each  $y \in Y$ , there is a  $x \in X$  such that  $a(x)$ <br>= y. A mapping  $a: X \rightarrow Y$  is a permutation if<br>and only if a is surjective and injective. If a is a<br>permutation, then  $r = n$ 

For each  $y \in Y$ , there is a  $x \in X$  such that a(x)<br>
= y. A mapping a :  $X \rightarrow Y$  is a permutation if<br>
and only if a is surjective and injective. If a is a<br>
permutation, then  $r = n$ . However, the converse<br>
is not true.<br>
Let S = y. A mapping a :  $X \rightarrow Y$  is a permutation if<br>and only if a is surjective and injective. If a is a<br>permutation, then r = n. However, the converse<br>is not true.<br>Let Sr be the set of all permutations from X onto<br>X itself w denoted by (x1 x2...xs) and only if a is surjective and injective. If a is a<br>permutation, then r = n. However, the converse<br>is not true.<br>Let Sr be the set of all permutations from X onto<br>X itself with a binary operation

then (1i ∈ IHi is a subgroup of G. For any  $\in$  A, 1<br>
nonempty subset K of G, let {Hi : i ∈ I} be the  $\pi(x)$  = xi+1, i = 1, 2, ..., s = 1, π(xs<br>
family of all subgroups of G which contain K.  $\pi$  x,  $\pi$  ∈ X\{x1, x2,... Then  $\begin{aligned}\n\text{Then } \text{a} & \text{b} & \text{c} \\
\text{the output of the set } K \text{ and denoted } (K) \\
\text{the action of the set } K \text{ and denoted } (K) \\
\text{the function } g \in S \text{ or a nonempty finite set } A \text{ and a finite} \\
\text{the function } g \in S \text{ or a nonempty finite set } A \text{ and a finite} \\
\text{the function } g \in S \text{ or a nonempty finite set } A \text{ and a finite} \\
\text{the function } g \in S \text{ or a nonempty finite set } A \text{ and a finite} \\
\text{the function } g \in S \text{ or a nonempty finite set } A \text{$ permutation, then  $r = n$ . However, the converse<br>is not true.<br>Let Sr be the set of all permutations from X onto<br>X itself with a binary operation of composition<br>\* Then Sr is a group which is called the<br>**symmetric group** on t is not true.<br>Let Sr be the set of all permutations from X onto<br>X itself with a binary operation of composition<br>\* . Then Sr is a group which is called the<br>**symmetric group** on the set X . For a  $\pi \in Sr$ <br>and pairwise differ Let Sr be the set of all permutations from X onto<br>X itself with a binary operation of composition<br>\* . Then Sr is a group which is called the<br>**symmetric group** on the set X . For a  $\pi \in S$ r<br>and pairwise different elements X itself with a binary operation of composition<br>\* Then Sr is a group which is called the<br>symmetric group on the set X. For a  $\pi \in Sr$ <br>and pairwise different elements x1, x2, ..., xs<br> $\in X$ , if<br> $\pi(xi) = xi+1$ ,  $i = 1, 2, ..., s-1$ , \* . Then Sr is a group which is called the<br>symmetric group on the set X . For a π ∈ Sr<br>and pairwise different elements x1, x2, ..., xs<br>∈ X, if<br> $\pi(xi) = xi+1, i = 1, 2, ..., s-1, \pi(xs) = x1, \pi(x)$ <br>= x, x ∈ X\{x1, x2, ..., xs },<br>then w and pairwise different elements x1, x2, ..., xs<br>  $\in$  X, if<br>  $\pi(xi) = xi+1, i = 1, 2, ..., s-1, \pi(xs) = x1, \pi(x)$ <br>  $= x, x \in X \setminus \{x1, x2,..., xs\}$ ,<br>
then we call  $\pi$  the s-cyclic permutation, which is<br>
denoted by (x1 x2...xs), or  $\pi s$  for s  $\pi(xi) = xi+1, i = 1, 2, ..., s-1, \pi(xs) = x1, \pi(x)$ <br>  $= x, x \in X \setminus \{x1, x2,..., xs\}$ ,<br>
then we call  $\pi$  the s-cyclic permutation, which is<br>
denoted by  $(x1 x2...xs)$ , or  $\pi s$  for short. Each<br>
permutation  $g \in Sr$  can be represented as the<br>
compos (ii)  $n = 1, 2, ..., 5$ ..., with  $\theta$  and  $\theta$  is  $\theta$  is A,  $\alpha = X$ ,  $(31, X2,..., X3)$ ,<br>
denoted by  $(X1 X2... X8)$ , or  $\pi s$  for short. Each<br>
permutation  $g \in Sr$  can be represented as the<br>
composition of some pairwise disjoint cyclic<br>
permutations in Sr, that is, there exist some<br>
pairw then we can *n* the s-cyclic permitation, which is<br>denoted by (x1 x2...xs), or  $\pi$ s for short. Each<br>permutation  $g \in Sr$  can be represented as the<br>composition of some pairwise disjoint cyclic<br>permutations in Sr, that is, denoted by (x1 x2...xs), or as for short. Each<br>permutation  $g \in Sr$  can be represented as the<br>composition of some pairwise disjoint cyclic<br>permutations in Sr, that is, there exist some<br>pairwise disjoint cyclic permutation

that<br> $g = \pi 10$  \* ... $\pi 1d1$  \*  $\pi 20$  \* ... \*  $\pi 2d2$  \* ...

permutation  $g \in Sr$  can be represented as the<br>composition of some pairwise disjoint cyclic<br>permutations in Sr, that is, there exist some<br>pairwise disjoint cyclic permutations  $\pi$  10, ..., $\pi$ <br>1d1, $\pi$ 20, ..., $\pi$ 2d2, ... composition of some pairwise disjoint cycinc<br>permutations in Sr, that is, there exist some<br>pairwise disjoint cyclic permutations  $\pi$  10, ..., $\pi$ <br>1d 1,  $\pi$ 20, ..., $\pi$ 2d2, ..., $\pi$ r0, ..., $\pi$ rdr  $\in$  Sr such<br>that<br> $\pi$  permutations in Sr, that is, there exist some<br>pairwise disjoint cyclic permutations  $\pi$  10, ..., $\pi$ <br>1d1, $\pi$ 20, ..., $\pi$ 2d2, ..., $\pi$ r0, ..., $\pi$ rdr  $\in$  Sr such<br>that<br> $g = \pi$  10 \* ... $\pi$  1d1 \*  $\pi$ 20 \* ... \*  $\pi$ 2d2 \* . pairwise disjoint eyenc permutations  $\pi$  10, ..., $\pi$ <br>1d1,  $\pi$ 20, ..., $\pi$ 2d2, ..., $\pi$ r0, ..., $\pi$ rdr  $\in$  Sr such<br>that<br> $g = \pi$  10 \* ... $\pi$  1d1 \*  $\pi$ 20 \* ... \*  $\pi$ 2d2 \* ...<br> $\pi$   $\pi$   $\pi$  \* ...\*  $\pi$   $\pi$   $\pi$ <br> $\pi$  1ar , $hz0$ , ..., $hz02$ , ..., $hz0$ , ..., $hz0$  , ..., $hz0$  , ..., $hz01$   $\leq$  31 such<br>that<br> $g = \pi 10 * ... \pi 1d1 * \pi 20 * ... * \pi 2d2 * ...$ <br> $* \pi r0 * ... * \pi rdr$ ,<br>where  $1d1 + 2d2 + ... + rdr = r$ ,  $\pi ij1 \neq \pi ij2$ ,  $\pi i0 =$ <br>(i),  $i = 1, 2, ..., r$ ,  $j1$ ,  $j2 = 1,$  $\mu$  and  $\alpha$  =  $\pi$  10 \* ..., *π* 1d1 \* *π*20 \* ... \* *π*2d2 \* ...<br>
\* *π*τ0 \* ... \* *π*τdr,<br>
where 1d1 +2d2 + ... +rdr = r, *π*ij1 ≠ *π*ij2, *π*i0 =<br>
(i), i = 1, 2, ...,r, i1, i2 = 1, 2,..., di, and j1 ≠ j2.<br>
We call g FRO \* .... we obtain a equivalence relation ∼ and a<br>  $\pi r0$  \* ...\*  $\pi rdr$ ,<br>
where 1d1 +2d2 + ... +rdr = r,  $\pi i$ j1 ≠  $\pi i$ j2,  $\pi i$ 0 =<br>
(i), i = 1, 2, ...,r, j1, j2 = 1, 2,..., di, and j1 ≠ j2.<br>
We call g has the form o where  $1d1 + 2d2 + ... + rdr = r$ ,  $\pi ij1 \neq \pi ij2$ ,  $\pi i0 =$ <br>(i),  $i = 1, 2, ..., r$ ,  $ji$ ,  $j2 = 1, 2, ..., di$ , and  $ji \neq j2$ .<br>We call g has the form of 1d1 2d2 ...rdr.<br>Moreover, we call g is an even permutation if<br>only and ifr  $- (d1 + d2 + ... + dr)$  is a where  $\overline{H}$  and  $\overline{H}$  and  $\overline{H}$  and  $\overline{H}$  and  $\overline{H}$  and  $\overline{H}$   $\overline{H$ of equivalence classes are

by and ifr  $-(d1 + d2 + ... + dr)$  is an even<br>then. Otherwise, we call g odd permutation.<br>a nonempty subset Mr, n of Fr, n and a<br>empty subgroup H of Sr, we introduce an<br>on  $\phi : H \times Mr, n \rightarrow Mr, n$ , and for any  $g \in H$ <br> $a \in Mr, n$ ,<br> $g, a)(x) = a(g(x)),$ 

$$
\frac{1}{|H|}\sum_{g\in H}\mathop{\rm Fix}(g)
$$

number. Otherwise, we call g odd permutation.<br>For a nonempty subset Mr,n of Fr,n and a<br>nonempty subgroup H of Sr, we introduce an<br>action  $\phi : H \times Mr, n \rightarrow Mr, n$ , and for any  $g \in H$ <br>and  $a \in Mr, n$ ,<br> $(\phi(g, a))(x) = a(g(x)), \forall x \in X$ .<br>Thus, we For a nonempty subset Mr,n of Fr,n and a<br>nonempty subgroup H of Sr, we introduce an<br>action  $\phi : H \times Mr, n \rightarrow Mr, n$ , and for any  $g \in H$ <br>and  $a \in Mr, n$ ,<br> $(\phi(g, a))(x) = a(g(x)), \forall x \in X$ .<br>Thus, we obtain a equivalence relation  $\sim$  and a<br>partit nonempty subgroup H of Sr, we introduce an<br>action  $\phi : H \times Mr, n \rightarrow Mr, n$ , and for any  $g \in H$ <br>and  $a \in Mr, n$ ,<br> $(\phi(g, a))(x) = a(g(x)), \forall x \in X$ .<br>Thus, we obtain a equivalence relation ∼ and a<br>partition of Mr,n. According to Lemma 2.1,<br>when t action  $\phi : H \times Mr, n \rightarrow Mr, n$ , and for any  $g \in H$ <br>and  $a \in Mr, n$ ,<br> $(\phi(g, a))(x) = a(g(x)), \forall x \in X$ .<br>Thus, we obtain a equivalence relation  $\sim$  and a<br>partition of Mr,n. According to Lemma 2.1,<br>when the subgroup H acts on Mr,n, the number<br>of ( $\phi$ (g, a))(x) = a(g(x)),  $\forall x \in X$ .<br>
Thus, we obtain a equivalence relation ~ and<br>
partition of Mr,n. According to Lemma 2.<br>
when the subgroup H acts on Mr,n, the numbe<br>
of equivalence classes are<br>  $\frac{1}{|H|} \sum_{g \in H} \frac{1$ ( $\psi(\mathbf{g}, \mathbf{a})/\mathbf{a}$ )  $\mathbf{a}_{\mathbf{g}}(\mathbf{a})$ ),  $\mathbf{v} \mathbf{x} = \mathbf{x}$ .<br>
Thus, we obtain a equivalence relation  $\sim$  and a<br>
partition of Mr,n. According to Lemma 2.1,<br>
when the subgroup H acts on Mr,n, the number<br>  $\frac{1}{|H|}$ Fins, we obtain a equivalence claston and a partition of Mr,n. According to Lemma 2.1,<br>partition of Mr,n. According to Lemma 2.1,<br> $\frac{1}{|H|} g \in H$  [Fix(g)],<br> $\frac{1}{|H|} g \in H$  [Fix(g)],<br>where Fix(g) = {a ∈ Mr,n | a(g(x)) = a partition of M1, I. According to Eclimia 2.1,<br>when the subgroup H acts on Mr,n, the number<br>of equivalence classes are<br> $\frac{1}{|H|} \sum_{g \in H}^{\infty} |Fix(g)|$ ,<br>where  $Fix(g) = \{a \in Mr, n \mid a(g(x)) = a(x), \forall x \in X\}$ . In the next section, we discuss t when the stoggloup H acts of MH, if, the humber<br>  $\frac{1}{|H|} \sum_{g \in H} |Fix(g)|$ ,<br>  $\frac{1}{|H|} \sum_{g \in H} |Fix(g)|$ ,<br>
where  $Fix(g) = \{a \in Mr, n \mid a(g(x)) = a(x), \forall x \in X\}$ . In the next section, we discuss the<br>
number of equivalence classes of  $\sim$  with



**of Sr**, we can build the subgroup  $\langle K \rangle$ <br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>
specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>  $g$  eneral cyclic subgroup in Sr.<br>
Next, we list some subgroups of symmetric **Contract Control Con Contract Solution**<br> **Contract Specially, for any element g**  $\in$  Sr,  $\langle g \rangle$  is a<br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>  $\in$  Ck, g1 is a k-cyc<br>
general cyclic subgroup in Sr.<br>
Next, we list some subgroups of **Example 11**<br> **Academic Education**<br> **Internation**<br>
of Sr, we can build the subgroup  $\langle K \rangle$ <br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>
general cyclic subgroup in Sr.<br>
Next, we list some subgroups of symmetric  $\begin{cases$ 

**1. Academic Education**<br> **1. Academic Education**<br> **1. Confidentity** House<br> **1. Confidential Conference on Soc**<br> **1. Confidential I Confidential Examplement**  $g \in S$ **r**,  $\langle g \rangle$  is a<br> **1. If**  $g = Ck$ ,  $g1$ **Academic Education**<br> **and International Conference**<br>
and Intelligent<br>
of Sr, we can build the subgroup  $\langle K \rangle$ <br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>  $\langle E \rangle$  we define Ck be the subgroup in Sr.<br>
Next, we list **2.** Cr = { (12 ... r) is a cyclic group of Sr and forefrence on Section (12 ... r) is a cyclic subspace of Specially, for any element  $g \in S$ r,  $\langle g \rangle$  is a we define Ck be the subset of  $\in C$ k set of  $\in C$ k set of  $\in C$ k **Alternational Conference on Social Properties and Intelligent Technol<br>
of Sr, we can build the subgroup**  $\langle K \rangle$  **we define Ck be the subset of Si<br>
Specially, for any element**  $g \in Sr$ **,**  $\langle g \rangle$  **is a<br>
general cyclic subgroup Contained Solution**<br> **of Sr**, we can build the subgroup  $\langle K \rangle$ .<br>
Sepecially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>
general cyclic subgroup in Sr.<br>
Next, we list some subgroups of symmetric<br>
Next, we list some subgroups **Example 11**<br> **Example 11**<br>
For Specially, for any element g  $\in$  Sr,  $\langle g \rangle$  is a<br>
Specially, for any element g  $\in$  Sr,  $\langle g \rangle$  is a<br>
general cyclic subgroup in Sr.<br>
Next, we list some subgroups of symmetric  $\begin{cases} 2...&k$ **IF The Fourier Control of** Sr, we can build the subgroup  $\langle K \rangle$  we define Ck be the subset of S<br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>
next, we list some subgroup in Sr.<br>
Next, we list some subgroup of symme of Sr, we can build the subgroup  $\langle K \rangle$  we define Ck be the subset of Sr<br>
Specially, for any element  $g \in Sr$ ,  $\langle g \rangle$  is a<br>  $\langle E \rangle$  is a<br>  $\langle E \rangle$  is a  $\langle K \rangle$  we define Ck be the subset of Sr<br>
general cyclic subgroup in deneral cyclic subgroup in Sr (E Ck, g1 is a k-cyclic perm<br>
Next, we list some subgroups of symmetric  $2, ..., k$ } onto<br>
group Sr (**permutation groups**).<br>  $\{1, 2, ..., k\}$  and<br>  $\{1, 2, ..., k\}$  and<br>  $\{2, 1, k + 2, ..., k\}$ <br>  $\{2, 2, x \in \$ Next, we list some subgroups of symmetric  $2, ..., k$  onto<br>  $\{1, 2, ..., k\}$  and<br>  $\{2, ..., k\}$  are  $\{k + 1, k + 2, ...,$ <br> group Sr (**permutation groups**).<br>
1. Ir =  $\langle$  (1)) is the **identity subgroup** of Sr  $g1(x) = x, x \in \{k + 1, k + 2, \ldots, k\}$ <br>
and has only one element which is the identity. On the other hand, we define C<br>
2. Cr =  $\langle$  (12 ... r) But It is the identity subgroup of Sr<br>
and has only one element which is the identity. On the o<br>
2. Cr =  $\langle (12 \dots r) \rangle$  is a cyclic group of Sr and<br>
for the following two cases:<br>
thas r elements. Each element in Cr has the and has only one element which is the identity. On the other hand, we define Cr<sup>2</sup><br>
2. Cr =  $\langle$  (12 ... r) is a **cyclic group** of Sr and of Sr, and for any  $g_2 \in C$ <br>
has r elements. Each element in Cr has the form  $d^{\frac{$ **yclic group** of Sr and of Sr, and for<br>
ent in Cr has the form permutation from<br>
xists  $\varphi$ (d) elements of  $k+2,..., r$ } and<br>  $\varphi$  is the Euler function.  $g^2(x) = x, x \in \{$ <br>
ot have an element of By definition, it is<br>  $(r - 1) ...$ has r elements. Each element in Cr has the for<br>
of  $d^{\frac{1}{2}}$ . If d | r, then there exists  $\varphi$ (d) elements<br>
the form  $d^{\frac{1}{4}}$  in Cr, where  $\varphi$  is the Euler functic<br>
If d  $\nmid$  r, then Cr does not have an element<br>
t

of  $d^{\frac{n}{2}}$ . If  $d \mid r$ , then there exists  $\varphi(d)$  elements of<br>
the form  $d^{\frac{n}{2}}$  in Cr, where  $\varphi$  is the Euler function.<br>
If  $d \nmid r$ , then Cr does not have an element of<br>
By definition, it is<br>
the form  $d^{\frac{n}{2}}$ .<br> we is the Euler function.<br>  $g_2(x) = x, x \in A$ <br>
not have an element of<br>  $g_2(x) = x, x \in A$ <br>  $g_1(x) = x, x \in A$ <br>  $h_1(x) = h_2(x)$ <br>  $h_2(x) = h_3(x) + h_4(x)$ <br>
since  $h_1(x) = h_2(x) + h_3(x)$ <br>
since  $h_2(x) = h_3(x) + h_4(x)$ <br>
ger, then there exists  $\frac{r}{2} =$ If  $d \nmid r$ , then Cr does not have an element of<br>
the form  $d^{\frac{r}{2}}$ . S. D2r = ((12 ... r), (r(r - 1) ... 1)) is a<br>
dichard a group of Sr (r  $\geq$  3), and it has 2r<br>
dienents. Cr is a subgroup of D2r, which has r<br>  $\therefore$  the form  $d^{\frac{7}{2}}$  and  $D2r = \langle (12 \dots r), (r(r - 1) \dots 1) \rangle$  is a<br>
dihedral group of Sr ( $r \ge 3$ ), and it has 2r<br>
elements. Cr is a subgroup of D2r, which has r<br>
have the following two cases:<br>
have the following two cases:<br>  $\cdot$ 3. D2r =  $\langle$  (12 ... r), (r(r - 1) ... 1)) is a<br>
dihedral group of Sr (r  $\geq$  3), and it has 2r<br>
elements. Cr is a subgroup of D2r, which has r<br>
elements. As for the remaining r elements, we<br>
have the following two case **dihedral group** of Sr ( $r \ge 3$ ), and it has<br>elements. Cr is a subgroup of D2r, which I<br>elements. As for the remaining r elements<br>have the following two cases:<br><br>• Ifr is an odd integer, then there exis<br>elements of the for

elements. As for the remaining r elements, we<br>
have the following two cases:<br>
• Ifr is an odd integer, then there exists r Sr-k,<br>
elements of the form  $12^{\frac{r-1}{2}}$  in Cr.  $\{1\}$ ,<br>
• If r is an even integer, then there have the following two cases:<br>
• If is an odd integer, then there exists r Sr-k, since H1 \* H2 =<br>
elements of the form  $12^{\frac{r-1}{2}}$  in Cr. (1),<br>
• If r is an even integer, then there exists  $\frac{r}{2}$  H1 \*H2 is the inner

r!

First is an odd integer, then there exists r Sr-k, since H1 \* H2 = H2 \* H1 and elements of the form  $12\frac{r-1}{2}$  in Cr.<br>
F r is an even integer, then there exists  $\frac{r}{2}$  (11),<br>  $\frac{r}{2}$  elements of the form  $\frac{r-2}{2$ elements of the form  $12^{-2}$  in Cr.<br> **alternation** of the form  $12^{-2}$  in Cr.<br> **alternation** considers of the form  $2\frac{r}{2}$  in Sr. Thus, it follows that H<br>
elements of the form  $2\frac{r}{2}$  in Cr.<br>
4. Sr itself is a trivi From the form  $122$   $\frac{r_2}{2}$  elements of the form  $122$   $\frac{r_3}{2}$ , and  $\frac{r_1}{2}$  in Sr. Thus, it follows that H1 elements of the form  $2^{\frac{r}{2}}$  in Cr.<br>
Elements of the form  $2^{\frac{r}{2}}$  in Cr.<br>  $\frac{r_2}{2}$  element  $\frac{r}{2}$  elements of the form  $2\frac{r}{2}$  in Cr.<br>
4. Sr itself is a trivial subgroup and has r!<br>
elements. For any integer solution of  $1d1 + 2d2$ <br>  $+ ... + rdr = r$ ,<br>
there exists<br>  $\begin{array}{ll}\n r! & 7. D2k \\
 d1!d2!...dr!1d1 2d2...rdr & +1)(k +  
\ne$ r! elements. For any integer solution of  $1d1 + 2d2$ <br>  $+ ... + rd = r$ ,<br>
there exists<br>  $r!$ <br>  $d1!d2!...d1!d1 2d2...rdt$ <br>  $d2!...d1!d1 2d2...rdt$ <br>  $f10$ <br>
elements of the form  $1d1 2d2...rdt$ <br>  $f2$ <br>  $f3$   $f4$   $f1d1$ <br>  $f2$ <br>  $f3$   $f4$   $f1d1$ <br>  $f2$ <br> + ... + rdr = r,<br>
there exists<br>
r!<br>
fluid 1d2 !...dr!1d1 2d2 ...rdr<br>
elements of the form 1d1 2d2 ...rdr<br>
fluid 1d2 ....dr<br>
fluid 1d2 ....dr<br>
fluid 1d2 ....dr<br>
fluid 1d2 ....dr<br>
fluid 2d2 ...rdr<br>
fluid 1d2 ....dr<br>
permuta there exists<br>  $k(r-k)$  elements.<br>  $r!$ <br>  $\therefore$  Ar  $\frac{1}{d}$  1d2 ....dr<sup>1</sup><br>
elements of the form 1d1 2d2 ... rdr .<br>  $\therefore$  Ar = ((123), (124), ..., (12r)  $\angle$  is the<br>  $\therefore$  and the subset of all even<br>  $\therefore$  Ar = ((123), (124), g E H(12,...dr) and the other hand, we define Sr + be the subset of all even  $\frac{k(r-k)}{4}$  elements. We consid d1 !d2 !...dr!1d1 2d2 ...rdr <br>
elements of the form 1d1 2d2 ...rdr <br>
5. Ar = ((123), (124), ..., (12r)  $\rangle$  is the calternating group consists of all even 8.<br>
permutations in Sr (r  $\geq$  3).<br>
It has  $\frac{r!}{2}$  elements. F elements of the form 1d1 2d2... rdr.<br>
5. Ar = ((123), (124), ..., (12r)  $\rangle$  is the cases:<br>
alternating group consists of all even 8. Ak \* Ar-k = (()<br>
permutations in Sr (r ≥ 3).<br>
1t has  $\frac{r!}{2}$  elements. For any inte 5. Ar = ((123), (124), ..., (12r)  $\rangle$  is the cases:<br>
alternating group consists of all even 8. Ak \* Ar-k<br>
permutations in Sr (r  $\geq$  3).<br>
It has  $\frac{r!}{2}$  elements. For any integer solution of  $1d_1 + 1(k + 2)(k + 2)$ <br>
an e alternating group consists of all even<br>  $\begin{array}{ll}\n\text{alternating group} & \text{consists} & \text{of all even} \\
\text{int has } \frac{r}{2} \text{ elements.} & \text{For any integer solution of } 1d_1 + \frac{1}{k!(r-k)!} \\
\text{at a even even number, there exists}\n\end{array}$ <br>
It has  $\frac{r!}{2}$  elements. For any integer solution of  $1d_1 + \frac{1}{k!(r-k)!}$  elemen SISS of all even<br>  $g: Ak * Ar-k = ((12)^n)$ <br>  $g: x \in (12)^n$ , integer solution of  $1d_1 + \frac{k!(r-k)!}{4}$  elements.<br>  $g: Ck * D2r-2k = ((r(r-1)...(k+1)))$ <br>  $g: Ck * D2r-2k = ((r(r-1)...(k+1)))$ <br>
subset Sr, and for any  $g: 10.5k * Sr-k$  has k!(r When an inner directio It has  $\frac{r!}{2}$  elements. For any integer solution of  $1d_1$  +<br>an even number, there exists<br>r!<br>d1 !d2 !...dr!1d1 2d2 ...rdr<br>elements of the form 1d1 2d2 ... rdr .<br>Next, we define Sk be the subset Sr, and for any<br> $g \in Sk$ ,

It has  $\frac{1}{2}$  elements. For any integer solution of  $1a_1 + \frac{k((r-k))}{4}$  elements.<br>  $r!$ <br>  $k!$  d1 ld2 ...dr!1d1 2d2 ...rdr<br>  $r!$ <br>  $k!$  elements of the form 1d1 2d2 ...rdr<br>  $r!$ <br>  $k!$  elements of the form 1d1 2d2 ...rdr<br> an even number, there exists<br>
d1 ld2 !...dr!1d1 2d2 ...rdr <br>
d1 ld2 !...dr!1d1 2d2 ...rdr . (r(r − 1)...(k<br>
Next, we define Sk be the subset Sr, and for any 10. Sk \* Sr-k<br>
g ∈ Sk , g1 is a permutation from {1, 2,..., k} d1 !d2 !...dr!1d1 2d2 ...rdr <br>
elements of the form 1d1 2d2 ...rdr .<br>
Next, we define Sk be the subset Sr, and for any<br>  $g1 \le x, x \in \{k + 1, k + 2,..., r\}$ . (I)<br>
onto {1, 2,..., k} and<br>
g1 (x) = x, x  $\in \{k + 1, k + 2,..., r\}$ . (1)<br>
on elements of the form 1d1 2d2... rdr.<br>
Next, we define Sk be the subset Sr, and for a<br>  $g \in Sk$ , g1 is a permutation from {1, 2,...,<br>
onto {1, 2,..., k} and<br>  $g1 (x) = x, x \in {k + 1, k + 2,..., r}$ . (1)<br>
On the other hand, we define Srof the form 1d1 2d2... rdr.<br>
define Sk be the subset Sr, and for any<br>  $g$  10. Sk \* Sr−k has k!(<br>  $g$  1 is a permutation from {1, 2,..., k}<br>  $g$  10. Sk \* Sr−k has k!(<br>  $g$  1 is a permutation from {1, 2,..., k}<br>
define Sr−

from

Also,

# **International Conference on Social Development and Intelligent Technology (SDIT2024)**

ternational Conference on Social Development<br>and Intelligent Technology (SDIT2024)<br>we define Ck be the subset of Sr, and for any g1<br> $\in$  Ck, g1 is a k-cyclic permutation from {1,<br>2,..., k} onto<br>{1, 2,..., k} and Conference on Social Development<br>Intelligent Technology (SDIT2024)<br>k be the subset of Sr, and for any g1<br>is a k-cyclic permutation from {1,<br>and ∈ Ck, g1 is a k-cyclic permutation from {1,<br>2,..., k} onto<br>{1, 2,..., k} and<br>g1 (x) = x, x ∈ {k + 1, k + 2,..., r}. (3)<br>On the other hand, we define Cr<sup>2</sup>k be the subset<br>of Sr, and for any g2 ∈ Cr<sup>2</sup>k, g2 is a tional Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
effine Ck be the subset of Sr, and for any g1<br>
k, g1 is a k-cyclic permutation from {1,<br>
k} onto<br>
..., k} and<br>  $y = x, x \in \{k + 1, k + 2, ..., r\}$ . (3) ternational Conference on Social Developme<br>
and Intelligent Technology (SDIT202<br>
we define Ck be the subset of Sr, and for any  $\in$  Ck, g1 is a k-cyclic permutation from {<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 (x) = x, x

ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
we define Ck be the subset of Sr, and for any g1<br>  $\in$  Ck, g1 is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
we define Ck be the subset of Sr, and for any gl<br>
∈ Ck, gl is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
gl (x ternational Conference on Social Development<br>
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we define Ck be the subset of Sr, and for any g1<br>
∈ Ck, g1 is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 (x ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
we define Ck be the subset of Sr, and for any g1<br>
∈ Ck, g1 is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 (x fernational Conference on Social Development<br>and Intelligent Technology (SDIT2024)<br>we define Ck be the subset of Sr, and for any g1<br> $\in$  Ck, g1 is a k-cyclic permutation from {1,<br>2,..., k} onto<br>{1, 2,..., k} and<br>g1 (x) = ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
we define Ck be the subset of Sr, and for any g1<br>
∈ Ck, g1 is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 (x fernational Conference on Social Development<br>and Intelligent Technology (SDIT2024)<br>we define Ck be the subset of Sr, and for any g1<br> $\in$  Ck, g1 is a k-cyclic permutation from {1,<br>2,..., k} onto<br>{1, 2,..., k} and<br>g1 (x) =

and Intelligent I echnology (SDI12024)<br>
we define Ck be the subset of Sr, and for any gl<br>  $\in$  Ck, gl is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
gl (x) = x, x  $\in$  {k + 1, k + 2,..., r}. (3)<br>
O Sr, and for any g1<br>Sr, and for any g1<br>mutation from  $\{1,$ <br>.., r}. (3)<br>Cr<sup>-</sup>k be the subset<br>Cr<sup>-</sup>k, g2 is a<br>2,,..., r} onto  $\{k + 1,$ <br>(k is isomorphic to<br>Cr-k, respectively.<br> $D2r-2k$ , Ak and we define Ck be the subset of Sr, and for any<br>  $\in$  Ck, g1 is a k-cyclic permutation from  $\{2,..., k\}$  onto<br>  $\{1, 2,..., k\}$  and<br>  $g1 (x) = x, x \in \{k + 1, k + 2,..., r\}$ . (3)<br>
On the other hand, we define Cr<sup>-1</sup>k be the subset<br>
of Sr, *x* Ck be the subset of Sr, and for any g1<br>
g1 is a k-cyclic permutation from {1,<br>
c} and<br>
c,  $x \in \{k + 1, k + 2, ..., r\}$ . (3)<br>
her hand, we define Cr<sup>⊥</sup>k be the subset<br>
and for any g2 ∈ Cr−k, g2 is a<br>
ion from { $k + 1, k + 2, ..., r$ ∈ Ck, g1 is a k-cyclic permutation from {1,<br>
2,..., k} onto<br>
{1, 2,..., k} and<br>
g1 (x) = x, x ∈ {k + 1, k + 2,..., r}. (3)<br>
On the other hand, we define Cr<sup>-</sup>k be the subset<br>
of Sr, and for any g2 ∈ Cr-k, g2 is a<br>
permut permutation from {1,<br>
2,..., r}. (3)<br>
ne Cr<sup>2</sup>k be the subset<br>  $\in$  Cr<sup>2</sup>k , g2 is a<br>  $x + 2, ..., r$ } onto {k + 1,<br>
. (4)<br>
at Ck is isomorphic to<br>
to Cr<sup>2</sup>k, respectively.<br>
2k, D2r<sup>2</sup>k, Ak and<br>  $x \ge 3$ .<br>
k and subgroup H2 in<br> ′2r−2k , A ′k and Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ . ..., k} onto<br>
1, 2,..., k} and<br>
1 (x) = x, x ∈ {k + 1, k + 2,..., r}. (3)<br>
n the other hand, we define Cr<sup>1</sup>k be the subset<br>
f Sr, and for any  $g2 \text{ } \in \text{ } \text{Cr-k }$ ,  $g2$  is a<br>
armutation from {k + 1, k + 2,..., r} onto { [1, 2,..., k] and<br>
completed by  $\{k + 1, k + 2, ..., r\}$ . (3)<br>
On the other hand, we define Cr<sup>2</sup>k be the subset<br>
of Sr, and for any  $g2 \in Cr-k$ ,  $g2$  is a<br>
permutation from {k + 1, k + 2,..., r} onto {k + 1,<br>  $k + 2, ..., r$ } and<br>
g2( 72,..., r}. (3)<br>
ine Cr<sup>2</sup> k be the subset<br>
∈ Cr<sup>2</sup> k , g2 is a<br>
c + 2,..., r} onto {k + 1,<br>
}. (4)<br>
at Ck is isomorphic to<br>
c to Cr<sup>2</sup>k, respectively.<br>
p2k , D2r<sup>2</sup> 2k , Ak and<br>
<sup>2</sup> k ≥ 3.<br>
k and subgroup H2 in<br>
<sup>2</sup> \* H In the other hand, we define Cr<sup>⊥</sup>k be the subset<br>
f Sr, and for any  $g2 \in Cr-k$ ,  $g2$  is a<br>
ermutation from  $\{k + 1, k + 2,..., r\}$  onto  $\{k + 1,$ <br>  $+2,..., r\}$  and<br>  $2(x) = x, x \in \{1, 2,..., k\}$ . (4)<br>
y definition, it is clear that Ck i permutation from { $k + 1$ ,  $k + 2$ ,...,  $r$ } onto { $k + 1$ ,<br>  $k + 2$ ,...,  $r$ } and<br>  $g2(x) = x, x \in \{1, 2,..., k\}$ . (4)<br>
By definition, it is clear that Ck is isomorphic to<br>
Ck and Cr-k is isomorphic to Cr-k, respectively.<br>
Similarl

Sr-k, since H1  $*$  H2 = H2  $*$  H1 and H1  $\cap$  H2 =  $\{(1)\},\$ 

 $k + 2,..., r$ } and<br>  $g2(x) = x, x \in \{1, 2,..., k\}$ . (4)<br>
By definition, it is clear that Ck is isomorphic to<br>
Ck and Cr-k is isomorphic to Cr-k, respectively.<br>
Similarly, we can define D2k, D2r-2k, Ak and<br>
Ar-k, where  $k \ge 3$  and  $r$  $\frac{1}{2}$  (x) = x, x = {1, 2,..., k}. (4)<br>By definition, it is clear that Ck is isomorphic to<br>Ck and Cr-k is isomorphic to Cr-k, respectively.<br>Similarly, we can define D2k, D2r-2k, Ak and<br>Ar-k, where k  $\geq 3$  and r - k By definition, it is clear that Ck is isomorphic to<br>Ck and Cr-k is isomorphic to Cr-k, respectively.<br>Similarly, we can define D2k, D2r-2k, Ak and<br>Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>For any subgroup H1 in Sk and subgroup H By definition, it is clear that Ck is isomorphic to<br>Ck and Cr-k is isomorphic to Cr-k, respectively.<br>Similarly, we can define D2k , D2r-2k , Ak and<br>Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>For any subgroup H1 in Sk and subgroup Ck and Cr-k is isomorphic to Cr-k, respondingly, we can define D2k, D2r-2k, Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>For any subgroup H1 in Sk and subgrous Sr-k, since H1 \* H2 = H2 \* H1 and H1 {(1)}, H1 \* H2 is the inner direct and Cr-k is isomorphic to Cr-k, respective<br>
ilarly, we can define D2k, D2r-2k, Ak a<br>
k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>
any subgroup H1 in Sk and subgroup H2<br>
k, since H1 \* H2 = H2 \* H1 and H1 ∩ H2<br>
},<br>
\*H2 is the inner dir r–k is isomorphic to Cr–k, respectively.<br>
, we can define D2k, D2r–2k, Ak and<br>
ere k ≥ 3 and r — k ≥ 3.<br>
ubgroup H1 in Sk and subgroup H2 in<br>
ce H1 \* H2 = H2 \* H1 and H1 ∩ H2 =<br>
s the inner direct product of H1 and H2<br>
u Similarly, we can define D2k, D2r-2k, Ak and<br>Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>For any subgroup H1 in Sk and subgroup H2 in<br>Sr-k, since H1 \* H2 = H2 \* H1 and H1 ∩ H2 =<br>{(1)},<br>H1 \*H2 is the inner direct product of H1 and Ar-k, where  $k \ge 3$  and  $r - k \ge 3$ .<br>
For any subgroup H1 in Sk and subgroup H2 in<br>
Sr-k, since H1 \* H2 = H2 \* H1 and H1 ∩ H2 =<br>
{(1)},<br>
H1 \*H2 is the inner direct product of H1 and H2<br>
in Sr. Thus, it follows that H1 \*H2 h For any subgroup H1 in Sk and subgroup H2 in<br>Sr-k, since H1 \* H2 = H2 \* H1 and H1  $\cap$  H2 =<br>{(1)},<br>H1 \*H2 is the inner direct product of H1 and H2<br>in Sr. Thus, it follows that H1 \*H2 has |H1 ||H2<br>| elements. By the subgro Sr-k, since H1 \* H2 = H2 \* H1 and H1  $\cap$  H2 = {(1)},<br>H1 \*H2 is the inner direct product of H1 and H2<br>in Sr . Thus, it follows that H1 \*H2 has |H1 ||H2<br>| elements. By the subgroups listed above, we<br>can induce more subgrou H1 \*H2 is the inner direct product of H1<br>in Sr . Thus, it follows that H1 \*H2 has ||
| elements. By the subgroups listed abc<br>can induce more subgroups of Sr by inne<br>product operation. For example,<br>6. Ck \* Cr-k = ((12...k) H2 is the inner direct product of H1 and H2.<br>
Thus, it follows that H1 \*H2 has |H1 ||H2<br>
ments. By the subgroups listed above, we<br>
mduce more subgroups of Sr by inner direct<br>
uct operation. For example,<br>  $x^* Cr-k = ((12...k), ((k +$ the inner direct product of H1 and H2<br>
i, it follows that H1 \*H2 has |H1 ||H2<br>
By the subgroups listed above, we<br>
more subgroups of Sr by inner direct<br>
ration. For example,<br>
k = ((12...k), ((k + 1)(k + 2)...r)) has<br>
emen | elements. By the subgroups listed above, we<br>can induce more subgroups of Sr by inner direct<br>product operation. For example,<br>6. Ck \* Cr-k = ((12...k), ((k + 1)(k + 2)...r)) has<br>k(r — k) elements.<br>7. D2k \* D2r-2k = ((12..

cases: in Sr . Thus, it follows that H1 \*H2 has |H1 ||H2<br>
| elements. By the subgroups listed above, we<br>
can induce more subgroups of Sr by inner direct<br>
product operation. For example,<br>
6. Ck \* Cr-k = ((12...k), ((k + 1)(k + 2) product operation. For example,<br>
6. Ck \* Cr-k = ((12...k), ((k + 1)(k + 2)...<br>
k(r - k) elements.<br>
7. D2k \* D2r-2k = ((12...k), (k(k - 1).<br>
+ 1)(k + 2)...r), (r(r - 1)...(k + 1))) has<br>
k) elements. We consider the followi uct operation. For example,<br>  $k * Cr-k = ((12...k), ((k + 1)(k + 2)...r))$  ha<br>  $-k$ ) elements.<br>  $2k * D2r-2k = ((12...k), (k(k - 1)...1), ((k + 2)...r), (r(r - 1)...(k + 1)))$  has  $4k(r -$ <br>
lements. We consider the following for<br>
s:<br>  $k * Ar-k = ((123), (124), ..., (12k), ((k + 2)(k + 3)), ..., ((k + 1)($ eration. For example,<br>  $-k = ((12...k), ((k + 1)(k + 2)...r))$  has<br>
lements.<br>  $22r-2k = ((12...k), (k(k - 1)...1), ((k$ <br>  $)...r), (r(r - 1)...(k + 1))$  has  $4k(r -$ <br>
ts. We consider the following four<br>  $r-k = ((123), (124), ..., (12k), ((k +$ <br>  $k + 3)), ..., ((k + 1)(k + 2)r)$  has<br>
ments.<br>  $2r$ 6. Ck \* Cr-k = ((12...k), ((k + 1)(k + 2)...r)) has k(r - k) elements.<br>7. D2k \* D2r-2k = ((12...k), (k(k - 1)...1), ((k<br>+ 1)(k + 2)...r), (r(r - 1)...(k + 1))) has 4k(r -<br>k) elements. We consider the following four<br>cases: k(r — k) elements.<br>
7. D2k \* D2r-2k = ((12...k), (k(k — 1)...1), ((k<br>
+ 1)(k + 2)...r), (r(r — 1)...(k + 1))) has 4k(r —<br>
k) elements. We consider the following four<br>
cases:<br>
8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k 7. D2k  $\stackrel{\times}{\ast}$  D2r-2k = ((12...k), (k(k - 1)...1), ((k<br>+ 1)(k + 2)...r), (r(r - 1)...(k + 1))) has 4k(r -<br>k) elements. We consider the following four<br>cases:<br>8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k +<br> $1$ )(k + 2)(

8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k + elements.

9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),

(12r) > is the cases:<br>
of all even 8. A k \* A r-k = ((123), (<br>
(r ≥ 3).<br>
ger solution of 1d<sub>1</sub> + 1)(k + 2)(k + 3)), ..., ((k<br>
kt<sub>(r-k)</sub><sup>1</sup> elements.<br>
9. Ck \* D2r-2k = ((12...k)<br>
.. rdr . (r(r − 1)...(k + 1))) has 2k<br>
et 9. CK  $BZ1 - 2K = ((12...k), ((k + 1)))$ <br>
is  $2k(r - 1)...(k + 1))$  as  $2k(r - k)!$ <br>
from {1, 2,..., k}<br>
When an inner direct product<br>
acts on Mr, n, if a is equivale<br>
.., r}. (1)<br>
Sr-k be the subset<br>  $g2$ , where  $g1 \in H1$ ,  $g2 \in H2$ <br>
...,  $k + 2,...$ + 1)(k + 2)...r), (r(r − 1)...(k + 1))) has 4k(r −<br>k) elements. We consider the following four<br>cases:<br>8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k +<br>1)(k + 2)(k + 3)), ..., ((k + 1)(k + 2)r)) has<br> $\frac{k! (r-k)!}{4}$  elements. then then there exists g ∈ H1 \* H2 such that g = g1 \*<br>
g 2, where g1 ∈ H1 and g2 ∈ H2 , by (1) and (2), if there exists g = H1 and g(x)) = b(x), Yx ∈ E H1 and g2 ∈ H2 , by (1) and (2), it<br>
Since g1 ∈ H1 and g2 ∈ H2 , by gases:<br>
8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k +<br>
1)(k + 2)(k + 3)), ..., ((k + 1)(k + 2)r)) has<br>  $\frac{k!(r-k)!}{4}$  elements.<br>
9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),<br>
(r(r − 1)...(k + 1))) has 2k(r − k) elem 8. Ak \* Ar-k = ((123), (124), ..., (12k), ((k +<br>
1)(k + 2)(k + 3)), ..., ((k + 1)(k + 2)r)) has<br>  $\frac{k!(r-k)!}{4}$  elements.<br>
9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),<br>
(r(r − 1)...(k + 1))) has 2k(r − k) elements.<br>
1 S. Ak \* Ar-k = ((125), (124), ..., (12k), ((k +<br>
1)(k + 2)(k + 3)), ..., ((k + 1)(k + 2)r)) has<br>  $\frac{k!(r-k)!}{4}$  elements.<br>
9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),<br>
(r(r − 1)...(k + 1))) has 2k(r − k) elements.<br>
1 1)(k + 2)(k + 3)), ..., ((k + 1)(k + 2)r)  $\rangle$  h<br>  $\frac{k!(r-k)!}{4}$  elements.<br>
9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...;<br>
(r(r - 1)...(k + 1))) has 2k(r - k) elements.<br>
10. Sk \* Sr-k has k!(r - k)! elements.<br>
When an inn <u>k<sup>1(r-k)</sub></u> elements.<br>
9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),<br>
(r(r − 1)...(k + 1))) has 2k(r − k) elements.<br>
10. Sk \* Sr-k has k!(r − k)! elements.<br>
When an inner direct product group H1 \* H2<br>
acts on Mr,n, i</u></sup> 9. Ck \* D2r-2k = ((12...k), ((k + 1)(k + 2)...r),<br>(r(r - 1)...(k + 1))) has 2k(r - k) elements.<br>10. Sk \* Sr-k has k!(r - k)! elements.<br>When an inner direct product group H1 \* H2<br>acts on Mr,n, if a is equivalent to b in Mr 9. CK  $D21 \, 2K = ((12...k), ((k + 1)(k + 2)...1)),$ <br>  $(r(r-1)...(k + 1)))$  has  $2k(r-k)$  elements.<br>
10. Sk \* Sr-k has  $k!(r-k)!$  elements.<br>
When an inner direct product group H1 \* H2<br>
acts on Mr,n, if a is equivalent to b in Mr,n,<br>
then there exists (r(r - 1)...(k+1))) has 2k(r - k) elements.<br>
10. Sk \* Sr-k has k!(r - k)! elements.<br>
When an inner direct product group H1 \* H2<br>
acts on Mr,n, if a is equivalent to b in Mr,n,<br>
then there exists  $g \in H1 * H2$  such that  $g = g1$ 10. Sk \* Sr-k has k!(r — k)! elements.<br>When an inner direct product group H1 \* H2<br>acts on Mr,n, if a is equivalent to b in Mr,n,<br>then there exists  $g \in H1 * H2$  such that  $g = g1 * g2$ , where  $g1 \in H1$ ,  $g2 \in H2$  and<br> $a(g(x)) = b(x)$ , dements.<br>\*  $D2r-2k = ((1$ <br>1)...(k+1)) has k!(r<br>\* Sr-k has k!(r

International Conference on Social Development and Intelligent Technology (SDIT2024)	AC E. PL
and Intelligent Technology (SDIT2024)	$k$ ), there are $\frac{n!}{2k(r-k)(n-r)!}$ equiva
$\left(\frac{1}{ H_1 } \sum_{g_1 \in H_1} \left  \text{Fix}(g_1) \right  \right), \left( \frac{1}{ H_2 } \sum_{g_2 \in H_2} \sum_{\substack{F \in \mathbb{R} \setminus (g_2) \\ \text{size } F \subseteq H_2}} \text{Fix}(g_2) \right), \right)$	10. When Sk * Sr-k acts on since $ S k * Sr - k  = k!(r-1)(n-r)!$ since $ S k * Sr - k  = k!(r-1)(n-r)!$ in this subsection, we discuss the set of all equivalence classes.
injections from X to Y, which is denoted by $F$	

International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|}\sum_{g1 \in H_1} \left|\text{Fix}(g1)\right|\right), \left(\frac{1}{|H_2|}\sum_{g2 \in H_2} \sum_{[Fix}(g2)]\right), \qquad \text{10. When Sk * Sr-k as }$ <br>
3.1 The Set of all Injections from X to International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|}\sum_{g_1 \in H_1} \left|\text{Fix}(g_1) \right|\right), \left(\frac{1}{|H_2|}\sum_{g_2 \in H_2} \sum_{\text{Fix}(g_2) \mid} k\right), \text{ there are } \frac{n!}{2^{k(r-k)(n-r)!}}$  equivalence<br>
3.1 The Set of International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|}\sum_{g_1 \in H_1} \sum_{\text{Fix}(g_1)} \left(\frac{1}{|H_2|}\sum_{g_2 \in H_2} \sum_{\text{Fix}(g_2)} |F_{\text{IX}}(g_2)|\right),\right)$ <br>  $\left(\frac{1}{|H_2|}\sum_{g_1 \in H_2} \sum_{\text{Fix}(g_2)} |F$ International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|} \sum_{g \in H_1} \left| \text{Fix}(g1) \right| \right)$ ,  $\left(\frac{1}{|H_2|} \sum_{g \ge \epsilon H_2} \sum_{[Fix}(g2) ] \right)$ ,  $\left(\frac{1}{\text{R}(r-k)(n-r)!} \right)$  equivalent<br>
3.1 The Se International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|} \sum_{g \in H_1} \left| \text{Fix}(g1) \right| \right)$ ,  $\left(\frac{1}{|H_2|} \sum_{g \ge \epsilon H_2} \sum_{\substack{F \text{fix}(g2) \\ \text{size}}} \text{$ International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $\left(\frac{1}{|H_1|}\sum_{g_1 \in H_1} \left|\frac{1}{\text{Fix}(g_1)}\right|\right), \left(\frac{1}{|H_2|}\sum_{g_2 \in H_2} \left|\frac{1}{\text{Fix}(g_2)}\right|\right),$ <br>  $\left(\frac{1}{|H_2|}\sum_{g_1 \in H_2} \left|\frac{1}{\text{Fix}(g_2$ and Intelligent I echnology (SDI12024)<br>  $\left(\frac{1}{|H_1|}\sum_{g_1 \in H_1} \left(\frac{1}{|H_2|}\sum_{g_2 \in H_2} \sum_{[Fix(g_2)]}\right)\right),$  k), there are  $\frac{n!}{2k(r-k)(n-r)!}$ <br>
3.1 The Set of all Injections from X to Y<br>
In this subsection, we discuss the set of **f**<br>  $\left(\frac{1}{|H_1|} \sum_{g_1 \in H_1} \left[\text{Fix}(g_1) \right]\right), \left(\frac{1}{|H_2|} \sum_{g_2 \in H_2} \sum_{[Fix}(g_2)]\right),$ <br> **3.1 The Set of all Injections from X to Y**<br>
In this subsection, we discuss the set of all<br>
inform X to Y<br>
In this subsection, we dis [ $\overline{H_1}$ ]  $\sum_{g1 \in H_1}$  [Fix(g1)]),  $\overline{H_2}$ ]  $\sum_{g2 \in H_2}$  [Fix(g2)]),  $\overline{H_3}$  io. When Sk \* Sr -k ac<br>
since  $\overline{H_3}$  in this subsection, we discuss the set of all<br>
in this subsection, we discuss the set of al 3.1 The Set of all Injections from X to Y<br>
In this subsection, we discuss the set of all<br>
injections from X to Y<br>
In this subsection, we discuss the set of all<br>
injections from X to Y<br>
injections from X to Y, which is den 3.1 The Set of all Injections from X to Y<br>
In this subsection, we discuss the set of all<br>
injections from X to Y<br>
injections from X to Y, which is denoted by<br>
Xr,n. Ifr > n, then Xr,n =  $\emptyset$ . Otherwise,  $|Xr,n|$ <br>  $= \frac{n!}{($ 3.1 The Set of all Injections from X to Y<br>
in this subsection, we discuss the set of all<br>
injections from X to Y<br>
in this subsection, we discuss the set of all<br>  $X_r$  in. If  $r > n$ , then  $X_r$   $n = \emptyset$ . Otherwise,  $|Xr, n|$ <br> In this subsection, we discuss the set of all<br>
injections from X to Y, which is denoted by<br>
Example 3.1. If  $r = 7$ ,  $k = 3$  a<br>
Xr,n. If  $>r = n$ , then Xr,n =  $\infty$ . Otherwise, |Xr,n |<br>
have that<br>  $= \frac{n!}{(n-r)!}$ . Thus, we only myections from X to Y, which is denoted by<br>
Xr,n. If  $\pi$ , h, then Xr,n =  $\emptyset$ . Otherwise,  $|Xr,n|$  have that<br>  $\pi$  =  $\frac{n!}{(n-r)!}$ . Thus, we only the case when r  $\leq$  n. U. When 17<br>
When the subgroup H acts on Xr,n, for At, i.e. The identity of the case when  $r \leq n$ . Under  $\alpha$  is the number of equivalence classes are  $\frac{n!}{|H|}$  g  $\in H$ <br>
Fix( $\alpha$ ) =  $\frac{n!}{|H|}$  (Fix( $\alpha$ )) =  $\frac{n!}{|H|}$  (Fix( $\alpha$ )) =  $\frac{n!}{|H|}$  (Fix( $\alpha$ )) =  $\frac{n!}{|H|}$ When the subgroup H acts on Xr,n, for any  $g \in$  40320 equivalence cl<br>
H, if  $a \in Xr$ ,n is a fixed point of g, then  $a(g(x))$ <br>  $= a(x)$  for any  $x \in X$ . Since a is an injection 5760 equivalence cla<br>
from X to Y, it follows that = a(x) for any  $x \in X$ . Since a is an injection<br>
from X to Y, it follows that  $g(x) = x$  for any  $x$ <br>  $f(x) = 0$ , which ensures that  $g$  is an identity<br>  $g(x) = x$  for any  $x$ <br>  $f(x) = 0$ ,  $x$ , which cheap is an identity<br>  $f(x) = 0$ , mapping. Therefore, when the subgroup H acts<br>
on Xr,n, only the identity in H has fixed points.<br>
Moreover, if g is the identity mapping, then for<br>
equivalence classes.<br>
any a  $\in X$ r,n, a is a fixed point of g. Thus, the<br> on Xr,n , only the identity in H has fixed points.<br>
Moreover, if g is the identity mapping, then for<br>
any  $a \in X_r$ ,n, a is a fixed point of g. Thus, the<br>
the identity mapping are  $\overline{(n-r)!}$ . By Lemma 2.1,<br>
the identity map Moreover, if g is the identity mapping, then for<br>
any  $a \in Xr$ ,n, a is a fixed point of g. Thus, the<br>
total number of fixed points of g. Thus, the<br>
total number of fixed points of<br>
the identity mapping are  $\frac{n!}{(n-r)!}$ . By

any  $a \leftarrow X_r$ , a is a tixed point of g. Thus, the<br>
total number of fixed points of<br>
the identity mapping are  $\frac{n!}{(n-r)!}$ . By Lemma 2.1,<br>
the number of equivalence classes are  $\frac{1}{|H|} \sum_{\substack{3 \leq x/(7-3) \times (8-7)! \leq x \\ 1 \leq x/($ 1. When  $\Gamma$  acts on  $\Gamma(n-r)!$  equivalence classes.<br>
The identity mapping are  $\overline{(n-r)!}$ . By Lemma 2.1,<br>  $\Gamma$ ix(g) =  $\overline{|H|}$   $\overline{(n-r)!}$ .<br>  $\Gamma$ ix(g) =  $\overline{|H|}$   $\overline{(n-r)!}$ .<br>
Next, we use some special subgroups H acts on<br> the identity mapping are  $(n-r)!$ . By Lemma 2.1,<br>
the number of equivalence classes are  $\frac{1}{|H|} \sum_{\substack{n=1 \ n \text{ where } n \text{ is a}}^{\infty}$ <br>  $\frac{1}{2} \sum_{\substack{n=1 \ n \text{ otherwise}}}^{\infty}$ <br>  $\frac{1}{2} \sum_{\substack{n=1 \ n \text{ otherwise}}}^{\infty}$ <br>  $\frac{1}{2} \sum_{\substack{n=1 \ n \text{ otherwise}}}^{\infty}$ <br>

Xr,n.

Trix(g) =  $\frac{n!}{|H|}$  ( $\overline{n-r}$ )]<br>
Next, we use some special subgroups H acts on<br>
Xr,n.<br>
Xr,n.<br>
1. When Ir acts on Xr,n (n ≥ r), since  $|\text{Ir}| = 1$ ,<br>
there are  $\frac{n!}{(n-r)!}$  equivalence classes.<br>
2. When Cr acts on Xr,n (n ≥

equivalence classes. Xr,n.<br>
1. When Ir acts on Xr,n (n  $\geq$  r), since  $|\text{Ir }| = 1$ ,<br>
there are  $\frac{n!}{(n-r)!}$  equivalence classes.<br>
2. When Cr acts on Xr,n (n  $\geq$  r), since  $|\text{Cr }| = \text{r}$ ,<br>
there are  $\frac{n!}{r(n-r)!}$  equivalence classes.<br>
3. When  $k * C r - k$  acts on Xr,n (n  $\ge r > k$ ), 1. When  $\frac{n!}{(n-r)!}$  equivalence classes.<br>
2. When Cr acts on Xr,n (n ≥ r), since  $|Cr|$ <br>
there are  $\frac{n!}{(n-r)!}$  equivalence classes.<br>
3. When D2r acts on Xr,n (n ≥ r ≥ 3), since<br>  $|Cr|$ <br>
there are  $\frac{n!}{(n-r)!}$  equivalenc  $k * C r-k$  | = k(r-k), there are  $\frac{n!}{k(r-k)(n+1)!}$ <sup>N</sup> equivalence classes.<br>  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!} = 1$ <br>
or Figure 2.1, since |Cr | = r,<br>  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!} = 1$ <br>
cts on Xr,n (n ≥ r), since |Cr | = r,<br>  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!} = 1$ <br>
acts on Xr,n (n ≥ r ≥ equivalence there are  $\frac{\pi}{\sqrt{(n-r)!}}$  equivalence classes.<br>  $\frac{n!}{(n-r)!}$  equivalence classes.<br>  $\frac{n!}{(n-r)!}$  equivalence classes.<br>
4. When Sr (n ≥ r) acts on Xr,n (n ≥ r ≥ 3), since |Sr | = r!,<br>
there are  $\frac{n!}{\pi(n-r)!}$  equivalence cla 3. When D2r acts on Xr,n (n ≥ r ≥ 3), since |D2r<br>  $| = 2r$ , there are  $\frac{n!}{2r!(n-r)!}$  equivalence classes.<br>
4. When Sr (n ≥ r) acts on Xr,n, since |Sr | = r!, In this subsection, we discuss<br>
there are  $\frac{n!}{r!(n-r)!}$  equiva (n \gellareful r) and some Xr, n , since  $|Sr| = r!$ , ln this sum<br>
subgroup<br>
acts on Xr, n (n \gellareful r) can be permutation of  $\pi r$ , then<br>  $\frac{2n!}{r!(n-r)!}$  equivalence classes.<br>  $x * Cr - k$  acts on Xr, n (n \gellareful r) there are  $\frac{1}{r!(n-r)!}$  equivalence classes.<br>
5. When Ar acts on Xr, n (n ≥ r ≥ 3), since |Ar |  $\frac{r!}{2}$ , there are  $\frac{2n!}{r!(n-r)!}$  equivalence classes.<br>
6. When Ck\* Cr-k acts on Xr, n (n ≥ r > k)<br>
since |Ck\* Cr-k | = k F<sub>2</sub>, then Ar acts on Xr, n (n ≥ r > k),<br>  $\frac{r!}{2!}$ , there are  $\frac{2n!}{r!(n-r)!}$  equivalence classes.<br>
6. When Ck \* Cr-k acts on Xr, n (n ≥ r > k),<br>
since |Ck\* Cr-k | = k(r-k), there are  $\frac{n!}{k(r-k)(n-r)!}$  Co<br>
equivalence<br> 2, value are  $r(n-1)$  equivalence classes.<br>
6. When Ck\* Cr-k acts on Xr,n (n  $\geq r > k$ ),<br>
equivalence<br>
classes.<br>  $\begin{array}{ll}\n\text{E}[X(\pi)] = n. \\
\text{E}[X(\pi)] =$ 6. When Ck\* Cr-k acts on Xr,n (n ≥ r > k),<br>
since  $|Ck* Cr-k| = k(r-k)$ , there are  $\frac{k(r-k)(n-r)!}{k(r-k)(n-r)!}$  Conversely, if the conditions a<br>
equivalence<br>
classes.<br>
7. When D2k \* D2r−2k acts on Xr,n (n ≥ r > k<br>
23), since  $|D2k * D2$  $C\mathbf{r}$  -k acts on  $\mathbf{r}$ <br>  $-\mathbf{k}$  | = k(r-k), the<br>
\* $\mathbf{r} \cdot \mathbf{D}2\mathbf{r}$  -2k acts of<br>  $2\mathbf{k} \times \mathbf{D}2\mathbf{r}$  -2k| =

classes.

are  $\frac{n!}{4k(r-k)(n-r)!}$  equivalence classes.

 $k *$  Ar-k acts on Xr,n (n  $\ge r > k \ge 3$ ,  $k *$  Ar-k| =  $\frac{k!(r-k)!}{4}$ , there a(xs1 + since  $|Ck* Cr-k| = k(r-k)$ , there are  $\frac{r!}{k(r-k)(n-r)!}$  Conversely, if the conditions a<br>equivalence<br>classes.<br>Fix( $\pi$  i) = n.<br>7. When D2k \* D2r−2k acts on Xr, n (n ≥ r > k Moreover, for any g =  $\pi s1 * \pi s$ <br>27, since  $|D2k * D2r-2$ 

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k), there are  $\frac{n!}{2k(r-k)(n-r)!}$  equivalence classes.<br>10. When Sk \* Sr-k acts on Xr, n (n  $\geq$  r > k),<br>since  $|S k * S r-k| = k!(r-k)!$ , there are<br> $\frac{k!(r-k)!(n-r)!}{k!(r-k)!(n-r)!}$ **10.** Academic Education<br>
2. Academic Education<br>
2. Publishing House<br>
3. S  $k * Sr-k$  acts on Xr,n (n  $\ge r$  > **{}** Academic Education<br> $\overline{n-r}$ <sup>[</sup>] equivalence classes.<br> $r-k$  acts on Xr,n (n ≥ r > k),<br> $-k$  | = k!(r − k)!, there are **Solution**<br> **Solu**  $k * S r-k$  | = k!(r - k)!, then **Controllering House**<br> **r**  $\sum_{k=1}^{n}$  **Publishing House**<br>  $\sum_{k=1}^{n}$  equivalence classes.<br>
Sr -k acts on Xr,n (n ≥ r > k),<br>
r -k | = k!(r - k)!, there are<br>
es.<br>
r = 7, k = 3 and n = 8, then we **example 3.1.** If  $r = 7$ ,  $k = \frac{8!}{2(k-7)!}$ <br> **equivalence classes.**<br>
10. When Sk \* Sr-k acts on Xr,n (n  $\geq r > k$ ),<br>
since Sk \* Sr-k | = k!(r - k)!, there are<br>  $\frac{n!}{k!(r-k)!(n-r)!}$ <br>
equivalence classes.<br> **Example 3.1.** If  $r =$ **Example 3.1.** If  $r = 7$ ,  $k = 3$  and n = 8, then we have that 1. When  $12k + 2k(r-k)(n-r)!$  equivalence classes.<br>
10. When  $5k * 5r-k$  acts on  $Xr, n$  ( $n \ge r > k$ ), since  $|5k * 5r-k| = k!(r-k)!$ , there are  $\frac{k!(r-k)!(n-r)!}{k!(r-k)!}$  equivalence **Academic Educ**<br> **h**), there are  $\frac{n!}{2k(r-k)(n-r)!}$  equivalence classes<br>
10. When Sk \* Sr-k acts on Xr, n (n ≥ r<br>
since Sk \* Sr-k = k!(r – k)!, there<br>  $\frac{n!}{k!(r-k)!(n-r)!}$ <br>
equivalence classes.<br> **Example 3.1.** If r = 7, k = 3 **1.** Academic Education<br>
1. Publishing House<br>
1. Publishing House<br>
1. When Sk \* Sr-k acts on Xr,n (n  $\ge$  r > k),<br>
since  $|S k * S r - k| = k!(r - k)!$ , there are<br>  $\frac{n!}{k!(r-k)!(n-r)!}$ <br>
equivalence classes.<br> **Example 3.1.** If r = 7, k = **412** Academic Education<br>
41. Publishing House<br>
42. Publishing House<br>
42. Publishing House<br>
42. Publishing House<br>
42. Publishing House<br>
40320 equivalence classes.<br>
40320 equivalence classes.<br>
40320 equivalence classes.<br>
4 **1.** Publishing House<br>
k), there are  $\frac{n!}{2k(r-k)(n-r)!}$  equivalence classes.<br>
10. When Sk \* Sr-k acts on Xr, n (n ≥ r > k),<br>
since Sk \* Sr-k | = k!(r - k)!, there are<br>
equivalence classes.<br>
equivalence classes.<br>
have that<br> k), there are  $\frac{n!}{2k(r-k)(n-r)!}$  equivalence classes.<br>
10. When Sk \* Sr-k acts on Xr, n (n ≥ r > k),<br>
since Sk \* Sr-k | = k!(r - k)!, there are<br>  $\frac{n!}{k!(r-k)!(n-r)!}$ <br>
equivalence classes.<br> **Example 3.1.** If r = 7, k = 3 and n k), there are  $\frac{2k(r-k)(n-r)!}{k(r-k)(n-r)!}$  equivalence classes.<br>
10. When Sk \* Sr-k acts on Xr, n (n ≥ r > k),<br>
since  $|S k * S r - k| = k!(r - k)!$ , there are<br>  $\frac{n!}{k(r-k)!(n-r)!}$ <br>
Example 3.1. If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have tha 10. When Sk \* Sr-k acts on Xr,n (n  $\geq$  r > k),<br>
since Sk \* Sr-k | = k!(r - k)!, there are<br>  $\frac{n!}{k!(r-k)!(n-r)!}$ <br>
equivalence classes.<br> **Example 3.1.** If r = 7, k = 3 and n = 8, then we<br>
have that<br>
1. When 17 acts on F7,8, since  $|S k * S r - k| = k!(r - k)!$ , there are<br>  $\frac{k!(r-k)!(n-r)!}{k!(r-k)!(n-r)!}$ <br>
Example 3.1. If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have that<br>
1. When I7 acts on F7 ,8 , there are  $\frac{8!}{(8-7)!}$ <br>
40320 equivalence classes.<br>
2. When C7 act

 $\frac{n!}{k!(r-k)!}$ <br>
equivalence classes.<br> **Example 3.1.** If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have that<br>
1. When I7 acts on F7, 8, there are  $\frac{8!}{(8-7)!} =$ <br>
40320 equivalence classes.<br>
2. When C7 acts on F7, 8, there are  $\$ equivalence classes.<br> **Example 3.1.** If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have that<br>
1. When I7 acts on F7, 8, there are  $\frac{8!}{(8-7)!} =$ <br>
40320 equivalence classes.<br>
2. When C7 acts on F7, 8, there are  $\frac{8!}{7 \times (8-7)!} =$ **Example 3.1.** If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>have that<br>1. When I7 acts on F7,8, there are  $\frac{8!}{(8-7)!} =$ <br>40320 equivalence classes.<br>2. When C7 acts on F7,8, there are  $\frac{8!}{7 \times (8-7)!} =$ <br>5760 equivalence classes.<br>

have that<br>
1. When I7 acts on F7, 8, there are  $\frac{8!}{(8-7)!}$  =<br>
40320 equivalence classes.<br>
2. When C7 acts on F7, 8, there are  $\frac{8!}{7 \times (8-7)!}$  =<br>
5760 equivalence classes.<br>
3. When D14 acts on F7, 8, there are  $\frac{8!}{$ notes on F7,8, there are  $\frac{8!}{7 \times (8-7)!}$  =<br>
nece classes.<br>
acts on F7,8, there are  $\frac{8!}{7 \times (8-7)!}$  =<br>
acts on F7,8, there are  $\frac{8!}{2 \times 7 \times (8-7)!}$ <br>
lence classes.<br>
tts on F7,8, there are  $\frac{8!}{7! \times (8-7)!}$  = 8<br>
lasse 40320 equivalence classes.<br>
2. When C7 acts on F7, 8, there are  $\frac{8!}{7 \times (8-7)!}$  =<br>
5760 equivalence classes.<br>
3. When D14 acts on F7, 8, there are  $\frac{8!}{2 \times 7 \times (8-7)!}$ <br>
= 2880 equivalence classes.<br>
4. When S7 acts on F s on F7,8, there are  $\frac{8!}{7 \times (8-7)!}$  =<br>e classes.<br>ts on F7,8, there are  $\frac{8!}{2 \times 7 \times (8-7)!}$  = 8<br>ses.<br>on F7,8, there are  $\frac{8!}{7! \times (8-7)!}$  = 8<br>ses.<br> $C'_4$  acts on F7,8, there are  $\frac{2 \times 8!}{7! \times (8-7)!}$  =<br>3360 equivalen

5/60 equivalence classes.<br>
3. When D14 acts on F7, 8, there are  $\frac{8!}{2 \times 7 \times (8-7)!}$ <br>
= 2880 equivalence classes.<br>
4. When S7 acts on F7, 8, there are  $\frac{8!}{7! \times (8-7)!}$  = 8<br>
equivalence classes.<br>
5. When A7 acts on F7, notes on F7,8, there are  $2 \times 7 \times (8-7)!$ <br>
ence classes.<br>
ts on F7,8, there are  $\frac{8!}{7! \times (8-7)!} = 8$ <br>
ssses.<br>
tts on F7,8, there are  $\frac{2 \times 8!}{7! \times (8-7)!} =$ <br>
classes.<br>  ${}^kC'_4$  acts on F7,8, there are<br>  ${}^23360$  equivalenc

= 2880 equivalence classes.<br>
4. When S7 acts on F7, 8, there are  $\frac{8!}{7! \times (8-7)!} = 8$ <br>
equivalence classes.<br>
5. When A7 acts on F7, 8, there are  $\frac{2 \times 8!}{7! \times (8-7)!} = 16$  equivalence classes.<br>
6. When C<sub>3</sub> \* C<sub>4</sub> acts o on F', 8, there are  $\frac{2 \times 8!}{7! \times (8-7)!}$  = 8<br>
ses.<br>
son F', 8, there are  $\frac{2 \times 8!}{7! \times (8-7)!}$  =<br>
classes.<br>  $C'_4$  acts on F', 8, there are<br>
3360 equivalence classes.<br>  $D'_8$  acts on F', 8, there are<br>
= 840 equivalence c 5. When A7 acts on F7, 8, there are  $\frac{2 \times 8!}{7! \times (8-7)!}$  = 16 equivalence classes.<br>6. When C<sub>3</sub><sup>+</sup> C<sub>4</sub> acts on F7, 8, there are  $\frac{3 \times (7-3) \times (8-7)!}{3 \times (7-3) \times (8-7)!}$  = 3360 equivalence classes.<br>7. When D<sub>6</sub><sup>+ D</sup><sub>8</sub> act classes.<br>  ${}^kC'_4$  acts on F7,8, there are<br>  ${}^kC'_4$  acts on F7,8, there are<br>  ${}^kF'_8$  acts on F7,8, there are<br>  ${}^{\overline{1}} = 840$  equivalence classes.<br>  ${}^kA'_4$  acts on F7,8, there are<br>  ${}^kF'_8$  acts on F7,8, there are<br>  ${}^$ 

the number of equivalence classes are  $\frac{1}{|H|} \sum_{g \in H}$   $\frac{3 \times (7-3) \times (8-7)!}{4 \times 3 \times (7-3) \times (8-7)!} = \frac{3360 \text{ equivalent}}{16 \times 7}$ <br>
Next, we use some special subgroups H acts on  $\frac{8!}{3! \times (7-3)! \times (8-7)!} = 840 \text{ equivalent}$ <br>
Next, we use som Fix(g) =  $\overline{|H|}$   $\overline{(n-r)!}$ <br>
Next, we use some special subgroups H acts on<br>
Xr,n.<br>
Xr,n.<br>
Xr,n.<br>
1. When Ir acts on Xr,n (n ≥ r), since  $|Ir| = 1$ ,<br>
9. When  $C_3 * D'_8$  acts on F7<br>
there are  $\overline{(n-r)!}$  equivalence classes. on Xr,n (n ≥ r), since  $|\text{Ir}| = 1$ ,<br>
six( $i-3i$ x(s- $i$ )! = 1120 equivale<br>
nivalence classes.<br>  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!} = 1680$  equivale<br>
no Xr,n (n ≥ r), since  $|\text{Cr}| = r$ ,<br>
quivalence classes.<br>  $\frac{8!}{3! \times (7-3)! \times (8-7)!} =$ **3.2 The Set of all Mappings from X to Y**<br> **33.2 The Set of all Mappings from X to Y**<br> **33.2 The Set of all Mappings from X to Y**<br> **33.2 The Set of all Mappings from X to Y**<br> **33.2 The Set of all Mappings from X to Y**<br> **1**  $\frac{3 \times (7-3) \times (8-7)}{3 \times (8-7)} = 3360$  equivalence classes.<br>
7. When  $D_6 * D_8$  acts on F7,8, there are<br>  $\frac{4 \times 8!}{4 \times 3 \times (7-3) \times (8-7)!} = 840$  equivalence classes.<br>
8. When  $A_3 * A_4'$  acts on F7,8, there are<br>  $\frac{3!}{3! \times (7-3)!$ 7. When  $D_6 * D'_8$  acts on F7,8, there are<br>  $\frac{4}{4 \times 3 \times (7-3) \times (8-7)!} = 840$  equivalence classes.<br>
8. When  $A'_3 * A'_4$  acts on F7,8, there are<br>  $\frac{4 \times 8!}{3! \times (7-3)! \times (8-7)!} = 1120$  equivalence classes.<br>
9. When  $C'_3 * D'_8$  acts  $\frac{8!}{4 \times 3 \times (7-3) \times (8-7)!}$  = 840 equivalence classes.<br>
8. When A  $'_{3} * A'_{4}$  acts on F7 ,8 , there are<br>  $\frac{4 \times 8!}{3! \times (7-3)! \times (8-7)!}$  = 1120 equivalence classes.<br>
9. When C  $'_{3} * D'_{8}$  acts on F7 ,8 , there are<br>  $\frac$ 8. When A  $3 * A'_4$  acts on F7 ,8, there<br>  $\frac{4 \times 8!}{3! \times (7-3)! \times (8-7)!}$  = 1120 equivalence classes.<br>
9. When C  $3 * D'_8$  acts on F7 ,8, there<br>  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!}$  = 1680 equivalence classes.<br>
10. When S  $3 * S'_4$  act  $\frac{4 \times 8!}{3! \times (7-3)! \times (8-7)!}$  = 1120 equivalence classes.<br>
9. When C  $_3' * D_8'$  acts on F7, 8, there are  $\frac{1}{2 \times 3 \times (7-3) \times (8-7)!}$  = 1680 equivalence classes.<br>
10. When S  $_3' * S_4'$  acts on F7, 8, there are  $\frac{8!}{3! \$ 31×(7-3)<sup>1×(8-7)1</sup> = 1120 equivalence classes.<br>
9. When C  $3 * D'_8$  acts on F7, 8, there are<br>  $\frac{1}{2 \times 3 \times (7-3) \times (8-7)!}$  = 1680 equivalence classes.<br>
10. When S  $3 * S'_4$  acts on F7, 8, there are<br>  $\frac{8!}{3! \times (7-3)! \times (8-7)!}$  = 9. When C  $3 * D_8$  acts on F7, 8, there are  $\frac{8!}{2 \times 3 \times (7-3) \times (8-7)!} = 1680$  equivalence classes.<br>
10. When S  $3 * S_4$  acts on F7, 8, there are  $\frac{8!}{3! \times (7-3)! \times (8-7)!} = 280$  equivalence classes.<br>
3.2 The Set of all Mappi  $\frac{\alpha}{2 \times 3 \times (7-3) \times (8-7)!}$  = 1680 equivalence classes.<br>
10. When S<sup>'</sup><sub>3</sub> \* S<sup>'</sup><sub>4</sub> acts on F7 ,8 , there are<br>  $\frac{8!}{3! \times (7-3)! \times (8-7)!}$  = 280 equivalence classes.<br> **3.2 The Set of all Mappings from X to Y**<br>
In this sub 10. When  $S'_{3} * S'_{4}$  acts on F7, 8, there are  $\frac{8!}{3! \times (7-3)! \times (8-7)!} = 280$  equivalence classes.<br>
3.2 The Set of all Mappings from X to Y<br>
In this subsection, we discuss Fr,n. When the<br>
subgroup H acts on Fr,n, for any

quivalence classes.<br>  $\begin{array}{ll}\n\text{in } \mathbb{R}^n, \text{ the condition } x \text{ is an integer, }$  $\angle$  i  $\angle$  5), since |Ar | –<br>
of  $\pi$ , then<br>
ence classes.  $a(x1) = a(\pi r (x1)) = a(x2)$ <br>
on Xr,n (n  $\ge$  r > k),  $a(xr) = a(\pi r (xr))$ .<br>
Conversely, if the condition<br>
easy to check that a is a fixe<br>  $\angle$  |Fix( $\pi$ r)| = n.<br>
cts on Xr,n  $\frac{8!}{3! \times (7-3)! \times (8-7)!}$  = 280 equivalence classes.<br>
3.2 The Set of all Mappings from X to Y<br>
In this subsection, we discuss Fr,n. When the<br>
subgroup H acts on Fr,n, for any r-cyclic<br>
permutation πr in Sr, if a ∈ Fr,n 3.2 The Set of all Mappings from X to Y<br>
In this subsection, we discuss Fr,n. When the<br>
subgroup H acts on Fr,n, for any r-cyclic<br>
permutation  $\pi$  in Sr, if  $a \in Fr, n$  is a fixed point<br>
of  $\pi$ r, then<br>  $a(x1) = a(\pi r (x1)) = a(x2) =$ 3.2 The Set of all Mappings from X to Y<br>
In this subsection, we discuss Fr,n. When the<br>
subgroup H acts on Fr,n, for any r-cyclic<br>
permutation  $\pi$ r in Sr, if  $a \in Fr$ ,n is a fixed point<br>
of  $\pi$ r, then<br>  $a(x1) = a(\pi r (x1)) = a(x2)$ SET The set of an Nrappings Hom X to T<br>
In this subsection, we discuss Fr,n. When<br>
subgroup H acts on Fr,n, for any r-c<br>
permutation πr in Sr, if a ∈ Fr,n is a fixed<br>
of πr, then<br>
a(x1) = a(πr (x1)) = a(x2) = a(πr (x2)) and the sessecution, we discuss 11, we have the permutation πr in Sr, if  $a \in Fr, n$  is a fixed point of πr, then  $a(x1) = a(\pi r (x1)) = a(x2) = a(\pi r (x2)) = ... = a(x1) = a(\pi r (x1))$ .<br>Conversely, if the conditions above hold, it is easy to check examplementation  $\pi$ r in Sr, if  $a \in Fr$ , in sa fixed point<br>of  $\pi r$ , then<br> $a(x1) = a(\pi r (x1)) = a(x2) = a(\pi r (x2)) = ... = a(xr) = a(\pi r (xr))$ .<br>Conversely, if the conditions above hold, it is<br>easy to check that a is a fixed point of  $\pi r$ . Th bermutation *h* at in or, y i a ⊂ 1, y is a fixed point<br>of  $\pi r$ , then<br>a(x1) = a( $\pi r$  (x1)) = a(x2) = a( $\pi r$  (x2)) = ... =<br>a(xr) = a( $\pi r$  (xr)).<br>Conversely, if the conditions above hold, it is<br>easy to check that a is a a x i = a(πs2 ) = a(πs2 ) = a(πs2 ) = a(πs2 ) = ... = a(x1 ) = a(πs2 ) = a(πs2 (xs2 ) = ... = a(πs2 (xs2 ) = a(πs2 (xs2 )).<br>
Conversely, if the conditions above hold, it is<br>
easy to check that a is a fixed point of π.  $a(x1) = a(\lambda 1)(x1) = a(x2) = a(\lambda 1)(x2)$ <br>  $a(xr) = a(\pi r(xr))$ .<br>
Conversely, if the conditions above hold<br>
easy to check that a is a fixed point of  $\pi r$ .<br>
[Fix( $\pi r$ )] = n.<br>
Moreover, for any  $g = \pi s1 * \pi s2 \in Sr$ ,<br>  $\pi s1$  is an s1-cyclic p C1<sup>-</sup>K acts on Ar,ti (i)  $\frac{1}{2} - \frac{1}{8}$  (anversely, if the conditions above hold, it is  $\frac{1}{2}$  (and  $\frac{1}{2}$  (conversely, if the conditions above hold, it is  $\frac{1}{2}$  (and  $\frac{1}{2}$  (b)  $\frac{1}{2}$  (b)  $\frac{1}{2}$  (c)



**Example 18 Academic Education**<br> **Example 18 Academic Education**<br> **Example 18 Academic Education**<br> **Example 18 Academic Start of**  $\pi$ **r** . Thus,<br>
[Fix( $\pi$ s1 \*  $\pi$ s2)] = n2.<br>
Generally, for any  $g \in H$  such that g has the<br> **(Fig. 4**)<br> **Constant Controllishing House**<br>
easy to check that a is a fixed point of  $\pi$  . Thus, <br>  $\begin{array}{ll}\n & 1. \text{ When } \\ \text{Fix}(\pi s1 * \pi s2) = n2 \text{ .} \\
 \text{Generally, for any } g \in H \text{ such that } g \text{ has the } \\ \text{form of 1d1 2d2 ...rdr, we have that} \\
 & \text{Fix}(g) = n^{\sum_{i=1}^{r} d_i} \text{.}$ **Contract Control**<br> **Contract Control**<br> **Contract Contract Contract Contract Contract Control Conference on South and Intelligent Technol<br>
easy to check that a is a fixed point of**  $\pi r$ **. Thus,<br> \begin{array}{ll}\n\text{I. When } \text{Ir} \text{ acts on }** 

$$
|\text{Fix}(g)| = n^{\sum_{i=1}^{d_i} d_i}
$$

**for Academic Education**<br> **Configureries Education**<br> **Configureries Configureries Configureries**<br> **Configureries Configureries**<br> **Configureries Configureries**<br> **Configureries**<br> **Configureries Configureries**<br> **International Conference on So**<br> **International Conference on So**<br>
casy to check that a is a fixed point of  $\pi r$ . Thus,<br>  $\left[\text{Fix}(\pi s1 * \pi s2)\right] = n2$ .<br>
Generally, for any  $g \in H$  such that g has the<br>  $\left[\text{Fix}(\pi s1 * \pi s2)\right] = n2$ **Conserved that the subgroup H** acts on Fr,n , the number of  $\frac{1}{|H|} \sum_{g \in H}$   $|\text{Fix}(g)| = \frac{1}{|H|} \sum_{g \in H} \sum_{n=1}^{n} \sum_{i=1}^{n} a_i$  and  $\text{Integrating}$  Technol casy to check that a is a fixed point of  $\pi r$ . Thus, <br>  $\text{Riemannian}$  H **Example 18 Accelering House**<br>
easy to check that a is a fixed point of  $\pi$ . Thus, 1. W.<br>
[Fix( $\pi$ s1 \*  $\pi$ s2)] = n2.<br>
Generally, for any  $g \in H$  such that g has the 2. W.<br>
form of 1d1 2d2 ...rdr, we have that  $\frac{1}{r} \sum$ **EXECTE ALSET ACTS AND SURVED SURVED ALSO SET ALSO SET ALSO SET AND SET ALSO SET AND SET ALSO SET AND SET ALSO SET AND SET AND SET AND SURVED AND SURVED AND SURVED SURVED SURVED AND SURVED SURVED SURVED SURVED SURVED SURV** 

$$
\frac{1}{|H|} \sum_{g \in H} |\text{Fix}(g)| = \frac{1}{|H|} \sum_{g \in H} n^{\sum_{i=1}^{r} d_i}.
$$

Fr,n.

First  
\nthe *x* is a fixed point of π. Thus,  
\n
$$
[\text{Fix}(\pi s) * \pi s 2)] = n2.
$$
\nGenerally, for any  $g \in H$  such that g has the  
\n
$$
[\text{Fix}(\pi s) * \pi s 2)] = n2.
$$
\nGenerally, for any  $g \in H$  such that g has the  
\n
$$
[\text{Fix}(g)] = n^{\sum_{i=1}^{n} d_i}.
$$
\nIn conclusion, by Lemma 2.1, when the  
\nequivalence classes is  
\nequivalence classes is  
\nequivalence classes is  
\n
$$
\frac{1}{|H|} \sum_{g \in H} |\text{Fix}(g)| = \frac{1}{|H|} \sum_{g \in H} n^{\sum_{i=1}^{n} d_i}.
$$
\nNext, we use some special subgroups H acts on  
\n
$$
\frac{1}{2r} \left( \sum_{g \in H} \varphi(d) n^{\frac{r}{d}} + n^{\frac{r+1}{2}} \right) = \frac{1}{2r} \sum_{g \in H} \varphi(d) n^{\frac{r}{d}} + n^{\frac{r+1}{2}} \right) = \frac{1}{2r} \sum_{g \in H} \varphi(d) n^{\frac{r}{d}} + \frac{1}{2} n^{\frac{r+1}{2}}.
$$
\nNext, we use some special subgroups H acts on  
\n
$$
\frac{1}{2r} \left( \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{1}{2} n^{\frac{r+1}{2}} \right) = \frac{1}{2r} \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{1}{4} n^{\frac{r+1}{2}}.
$$
\nequivalence classes.  
\nWhen Sr acts on Fr, n, there are  
\n
$$
\frac{1}{2r} \left( \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{r}{2} n^{\frac{r+1}{2}} + \frac{r}{2} n^{\frac{r}{2}} \right) = \frac{1}{2r} \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{1}{4} n^{\frac{r+1}{2}} + \frac{1}{4} n^{\frac{r}{2}}.
$$
\nequivalence classes.  
\nWhen Sr acts on Fr, n, there are  
\n
$$
\frac{1}{r!} \sum_{g \in H} n^{\sum_{
$$

$$
\frac{1}{r!} \sum_{g \in H} n^{\sum_{i=1}^{r} d_i} = \frac{1}{r!} \sum_{d_1 + 2d_2 + \dots + rd_r = r} \frac{r!}{d_1! d_2! \dots d_r! 1^{d_1} 2^{d_2} \dots r^{d_r}} n^{\sum_{i=1}^{r} d_i} = \frac{(n+r-1)}{r!(n-1)}
$$

If is an odd intended, then there are<br>  $\frac{1}{2r} \left( \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + r n^{\frac{r+1}{2}} \right) = \frac{1}{2r} \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{1}{2} n^{\frac{r+1}{2}}$ .<br>
equivalence classes.<br>
• Ifr is an even number, then there are<br>  $+ \frac{1}{4} n^{\frac{r+2}{2$  $\frac{1}{2r} \left( \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + r n^{\frac{r+1}{2}} \right) = \frac{1}{2r} \sum_{d|r} \varphi(d) n^{\frac{r}{d}} + \frac{1}{2} n^{\frac{r+1}{2}}$ .<br>equivalence classes.<br>
• Ifr is an even number, then there are<br>  $+\frac{1}{4} n^{\frac{r+2}{2}} + \frac{1}{4} n^{\frac{r}{2}}$ .<br>
4.<br>
<br>
4.<br>
<br>
• Ifr i 2r  $\left\{\frac{2r}{d|r}\right\}$  2r  $\frac{1}{d|r}$  2<br>
equivalence classes.<br>
• Ifr is an even number, then there are<br>  $+\frac{1}{4}n^{\frac{r+2}{2}} + \frac{1}{4}n^{\frac{r}{2}}$ .<br>
4.<br>
4.<br>
<br>  $\frac{r!}{...d_r!1^{d_1}2^{d_2}...r^{d_r}}n^{\sum_{i=1}^{r} d_i} = \frac{(n+r-1)!}{r!(n-1)!}$ <br>
• Ifr equivalence classes.<br>
• Ifr is an even number, then there are<br>  $+\frac{1}{4}n^{\frac{r+2}{2}} + \frac{1}{4}n^{\frac{r}{2}}$ .<br>
4.<br>
<br>  $\frac{r!}{...d_r!1d_12d_2...r^{d_r}}n^{\sum_{i=1}^{r}d_i} = \frac{(n+r-1)!}{r!(n-1)!}$ <br>
• Ifr is an odd integer, then d1 + d2 + ... + dr is<br> • Ifr is an even number, then there are<br>  $+\frac{1}{4}n^{\frac{r+2}{2}} + \frac{1}{4}n^{\frac{r}{2}}$ .<br>
4.<br>
<br>  $\frac{r!}{...d_r!1^{d_1}2^{d_2}...r^{d_r}}n^{\sum_{i=1}^{r}d_i} = \frac{(n+r-1)!}{r!(n-1)!}$ <br>
• Ifr is an odd integer, then d1 + d2 + ... + dr is<br>
an odd integer. T .. $d_r!1^{d_1}2^{d_2}...r^{d_r}$   $r!(n-1)!$ <br>
• Ifr is an odd integer, then d1 + d2 + ... + dr is<br>
an odd integer. Thus, Ar has all elements g in Sr<br>
that g has the form of 1d1 2d2 ... rdr, where d1<br>
+ d2 + ... + dr is an odd integ • Ifr is an odd integer, then d1 + d2 + ... + dr i<br>an odd integer. Thus, Ar has all elements g in S<br>that g has the form of 1d1 2d2 . . . rdr, where d<br>+ d2 + ... + dr is an odd integer. By Lemma 2.1<br>the number of equivalen ger, then d1 + d2 + ... + dr is<br>
s, Ar has all elements g in Sr<br>
of 1d1 2d2 ... rdr, where d1<br>
odd integer. By Lemma 2.1,<br>
valence classes are<br>  $n^r + t_{r-2}n^{r-2} + ... + t_1n$ .<br>  $\frac{1}{r-k} \sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}$ <br>  $2r-2k$  acts o

ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>  $\frac{1}{r} \sum_{d|r} \varphi(d) n^{\frac{r}{d}}$ <br>
equivalence cl

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ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1}{r} \$ 

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and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1}{r} \$ ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1}{r} \$ ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1}{r} \$ 

ternational Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1}{r} \$ 

**ternational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
1. When Ir acts on Fr,n, there are nr equivalence<br>
classes and each contains one element.<br>
2. When Cr acts on Fr,n, there are<br>  $\frac{1$ 

<sup>∈</sup> Ar , r − (d1 + d2 + ... + dr ) is an even integer. We consider the following two cases: • Ifr is an even integer, then d1 +d2 + ... +dr is an even integer. Thus, Ar has all elements g in Sr that g has the form of 1d1 2d2 . . . rdr , where d1 + d2 + ... + dr is an even integer. By Lemma 2.1, the number of equivalence classes are <sup>g</sup> ni 1 di = d1 +2d2 ..+rdr =r ni 1 di = (trnr +tr−2nr−2 6. When Ck <sup>∗</sup> Cr−k acts on Fr,n , since Ck is

We consider the following two cases:<br>  $\frac{2}{r!} \sum_{g \in H} \sum_{n=1}^{r} a_i = \frac{2}{r!} \sum_{d_1+2d_2+\ldots+r d_r=r} \frac{1}{d_1!d_2! \ldots d_r!1^d}$ <br>
• Ifr is an even integer, then d1 +d2 + ... +dr is<br>
an even integer. Thus, Ar has all elements g in<br>  $\frac{1}{r!} \sum_{g \in H} n^{i=1} = \frac{1}{r!}$ <br>
• If is an even integer, then d1 +d2 +...+ $r d_r = r d_r$  if  $\frac{1}{4!}$  and  $\frac{1}{4!}$  are  $\frac{1}{4!}$ **•** If is an even integer, then d1 +d2 + ... +rd<sub>r</sub> = r<sup>-1</sup> + 1<sup>2</sup> + 1... +dr is<br>an even integer. Thus, Ar has all elements g in<br>Sr that g has the form of 1d1 2d2 . . . rdr, where<br>d1 + d2 + ... + dr is an even integer. B First an even integer, then all  $+d\omega$  + ... + are is <br>
Sr that g has the form of 1d1 2d2 ... rdr, where<br>  $\frac{2}{r!}$  Sr that g has the form of 1d1 2d2 ... rdr, where<br>  $\frac{2}{r!}$  Sr that g has the form of 1d1 2d2 ... rdr,

Sr that g has the form of 1d1 2d2...dr, where  
\nd1 + d2 + ... + dr is an even integer. By Lemma  
\n2.1, the number of equivalence classes are  
\n
$$
\frac{2}{r!}
$$
 g ∈ H in  $\frac{r}{2}$  1 di =  $\frac{r}{r!}$  d1 +2d2 + ... +rdr = T  
\n $\frac{1}{d_1!d_2!...d_r!1d_12d_2...r^{d_r}n!_1\frac{r}{2}}$  1 di =  $\frac{1}{r!}$  (trn + tr-2nr-2  
\n+ ... +t1 n2).  
\n6. When Ck \* Cr-k acts on Fr,n, since Ck is  
\nisomorphic to Ck and Cr-k is isomorphic to D2r-2k acts on Fr,n is equivalent to D2k a  
\nfor r, r, is equivalent to Ck acts on Fk,n and  
\nfor r, R, is equivalent to Cr-k acts on Fk,n and  
\nfor r, R, is equivalent to Cr-k acts on Fk, n and  
\nfor r, R, is equivalent to Cr-k acts on Fk, n and  
\nfor r, R, is equivalent to Cr-k acts on Fk, n and  
\nfor r, R, is equivalent to Cr-k acts on Fk, n and  
\nfor r, R, and  
\nfor

 $+ ... +1$  n2).<br>6. When Ck  $*$  Cr-k acts on Fr, n, since Ck is<br>isomorphic to Ck and Cr-k is isomorphic to<br>Cr-k, Ck acts

 $Cr-k$  acts on Fr,n is equivalent to  $Cr-k$  acts on

$$
\frac{1}{4k(r-k)}\left(\sum_{d|k}\varphi\left(d\right)n^{\frac{k}{d}}+kn^{\frac{k+1}{2}}\right)
$$

an odd integer. Thus, Ar has an elements g in Sr  
\nthat g has the form of 1d1 2d2...rdr, where d1  
\n+ d2 + ... + dr is an odd integer. By Lemma 2.1,  
\nthe number of equivalence classes are  
\n
$$
\frac{r}{2 \cdot 1 \cdot r^{d_r}} n^{i=1} = \frac{2}{r!} (t_r n^r + t_{r-2} n^{r-2} + ... + t_1 n).
$$
\n
$$
\left(\frac{1}{k} \sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right) \left(\frac{1}{r-k} \sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}\right)
$$
\nequivalence classes.  
\n7. When D2k \* D2r−2k acts on Fr,n, where k  
\n≥ 3 and r − k ≥ 3, since D2k is isomorphic to  
\nD2k and  
\n...  
\nD2r−2k is isomorphic to D2r−2k, D2k acts on Fr,  
\nin a equivalent to D2k acts on Fk,n and  
\nD2r−2k acts on Fr.n is equivalent to D2r−2k acts

 $2k * D2r-2k$  acts on Fr,n, where k

<sup>T</sup>  $a_2 + ... + ar$  is an odd integer. By Lemma 2.1,<br>
the number of equivalence classes are<br>  $\left(\frac{1}{k} \sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right) \left(\frac{1}{r-k} \sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}\right)$ <br>
equivalence classes.<br>
7. When D2k \* D2r−2k acts on Fr,n, where  $\sum_{r=1}^{r} a_r \frac{1}{n^{1-1}} d_i = \frac{2}{r!} (t_r n^r + t_{r-2} n^{r-2} + ... + t_1 n).$ <br>  $\left(\frac{1}{k} \sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right) \left(\frac{1}{r-k} \sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}\right)$ <br>
equivalence classes.<br>
7. When D2k \* D2r-2k acts on Fr,n, where k<br>  $\geq 3$  and  $r - k \ge$  $\sum_{r=1}^{n} n^{\sum_{r=1}^{n} d_i} = \frac{2}{r!} (t_r n^r + t_{r-2} n^{r-2} + ... + t_1 n).$ <br>  $\left(\frac{1}{k} \sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right) \left(\frac{1}{r-k} \sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}\right)$ <br>
equivalence classes.<br>
7. When D2k \* D2r−2k acts on Fr,n, where k<br>  $\geq 3$  and  $r - k \ge$ contraints are a total of  $\left(\frac{1}{k}\sum_{d|k} \varphi(d)n^{\frac{k}{d}}\right)\left(\frac{1}{r-k}\sum_{e|(r-k)} \varphi(e)n^{\frac{r-k}{e}}\right)$ <br>equivalence classes.<br>7. When D2k \* D2r−2k acts on Fr,n, where k<br>
≥ 3 and r − k ≥ 3, since D2k is isomorphic to<br>
D2k and<br>
"<br>
D2r−  $\left(\frac{1}{k}\sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right)\left(\frac{1}{r-k}\sum_{e|(r-k)} \varphi(e) n^{\frac{r-k}{e}}\right)$ <br>equivalence classes.<br>7. When D2k \* D2r-2k acts on Fr,n, where k<br>
≥ 3 and r − k ≥ 3, since D2k is isomorphic to<br>
D2r-2k is isomorphic to D2r-2k, D2k acts even. ( $\frac{k}{d|k}$  /  $\binom{r-k}{r-k}$  /  $\binom{r-k}{r-k}$ <br>
equivalence classes.<br>
7. When D2k \* D2r-2k acts on Fr, n, where k<br>
≥ 3 and r − k ≥ 3, since D2k is isomorphic to<br>
D2k and<br>
'''<br>
D2r-2k is isomorphic to D2r-2k, D2k acts on<br>
Fr, equivalence classes.<br>
7. When D2k \* D2r-2k acts on Fr,n, where k<br>  $\geq 3$  and  $r - k \geq 3$ , since D2k is isomorphic to<br>
D2k and<br>  $\binom{r}{k}$ <br>  $\binom{2r-2k}{2k}$  is isomorphic to D2r-2k, D2k acts on<br>
Fr,n is equivalent to D2k ac  $\frac{d_2!...d_r \frac{1}{1}d_1 \frac{2d_2...d_r}{1}}{2k}$  + If n 2).<br>  $\frac{d_2!...d_r \frac{1}{1}d_1 \frac{2d_2...d_r \frac{1}{1}}{1}}{2k}$  (Fig. 8 Cr-k acts on Fr,n, since Ck is<br>
When Ck  $\frac{k}{2}$  Cr-k acts on Fr,n, is equivalent to D2r-2k acts on Fk,n and<br>
Mo

$$
\left(\sum_{e|r-k}\varphi\left(e\right)n^{\frac{r-k}{e}}+(r-k)n^{\frac{r-k+1}{2}}\right).
$$

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### **International Conference on Social Development and Intelligent Technology (SDIT2024)**

**International Conference on Social Development**  
\nand Intelligent Technology (SDIT2024)  
\n
$$
\frac{1}{4k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} + kn^{\frac{k+1}{2}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k}{2}} \right).
$$
\n• If 2 | k and 2 | r – k, then the number of  
\n
$$
\frac{1}{4k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} + \frac{k}{2} n^{\frac{k+2}{2}} + \frac{k}{2} n^{\frac{k}{2}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + (r-k) n^{\frac{r-k+1}{2}} \right).
$$
\n• If 2 | k and 2 | r – k, then the number of  
\n
$$
\frac{1}{4k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} + \frac{k}{2} n^{\frac{k+2}{2}} + \frac{k}{2} n^{\frac{k}{2}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k}{2}} \right).
$$
\n8. When C k \* D2r–2k acts on Fr, n, where D2r–2k is isomorphic to D2r–2k is isomorphic to D2r–2k, similarly, there are 2 cases  
\ndepending on parity of r – k.  
\nIf r is an odd number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + (r-k) n^{\frac{r-k+1}{2}} \right).
$$
\nequivalence classes.

$$
\frac{1}{4k(r-k)} \left( \sum_{d|k} \varphi(d) n^d + \frac{1}{2} n^{-2} + \frac{1}{2} n^2 \right) \left( \sum_{e|r-k} \varphi(e) n^{-e} + (r-k)n^{-2} \right)
$$
\n• If 2 | k and 2 | r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{1}{4k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} + \frac{k}{2} n^{\frac{k+2}{2}} + \frac{k}{2} n^{\frac{k}{2}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} \right)
$$
\n8. When C k \* D2r–2k acts on Fr, n, where D2r–2k is isomorphic  
\nr-k ≥ 3, since C k is isomorphic to Ck and  
\nIf r is an odd number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + (r-k) n^{\frac{r-k+1}{2}} \right)
$$
\nequivalence classes.  
\n• If r is an even number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k}{2}} \right)
$$
\nequivalence classes.  
\nSr–k, Sk acts

 $k * D2r-2k$  acts on Fr,n, where

D2r-2k is isomorphic

$$
\frac{1}{2k(r-k)}\left(\sum_{d|k}\varphi\left(d\right)n^{\frac{k}{d}}\right)\left(\sum_{e|r-k}\varphi\left(e\right)n^{\frac{r-k}{e}}+(r-k)n^{\frac{r-k+1}{2}}\right)
$$

8. When Ck \* D2r−2k acts on Fr,n , where  
\nr-k ≥ 3, since Ck is isomorphic to Ck and  
\nIf r is an odd number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + (r-k) n^{\frac{r-k+1}{2}} \right)
$$
\nequivalence classes.  
\n• If r is an even number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k}{2}} \right)
$$
\nequivalence classes.  
\n• If r is an even number, then there are  
\n
$$
\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} + \frac{r-k}{2} n^{\frac{r-k+2}{2}} + \frac{r-k}{2} n^{\frac{r-k}{2}} \right)
$$
\nequivalence classes.  
\n9. When Ak \* Ar-k acts on Fr,n, where k ≥  
\n3 and r-k ≥ 3, since Ak is isomorphic to Ak  
\n3 and r-k ≥ 3, since Ak is isomorphic to Ak  
\n3 from r, n is equivalent to Ar-k, A k acts on Fr,n is  
\nequivalent to Ak acts on Fr,n, in  
\nequivalent to Ak acts on Fr,n, and Ar-k acts  
\n
$$
\frac{1}{k!(r-k)!}
$$
 (tk nk + tk−1n+  
\nrespectively. Thus, there are also 4 cases.  
\n• If 2  $k$  and 2  $k$  r – k, then the number of  
\nequivalence classes are  
\n1. When 17 acts on F7, 8,  
\n
$$
\frac{1}{k!(r-k)!}
$$
 (tk nk + tk−2n+… + t1  
\n2097152 equivalence classes.  
\n• If 7  $k$  = 3 ar  
\n2. When C7 acts on F7, 8, the

8. When Ck \* D2r-2k acts on Fr,n, where<br>  $r-k \ge 3$ , since Ck is isomorphic to Ck and<br>
Ifr is an odd number, then there are<br>  $\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r}$ <br>
equivalence classes.<br>
• Ifr is an even number, th r-k ≥ 3,since C k is isomorphic to Ck<br>
Ifr is an odd number, then there are<br>  $\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n \right)$ <br>
equivalence classes.<br>
• Ifr is an even number, then there are<br>  $\frac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{d|k$  $2k(r-k) \left(\frac{2}{d|k}r^{k-1}\right)$ <br>
equivalence classes.<br>
• Ifr is an even number, then there are<br>  $\frac{1}{2k(r-k)} \left(\sum_{d|k} \varphi(d) n^{\frac{k}{d}}\right) \left(\sum_{e|r-1}$ <br>
equivalence classes.<br>
9. When Ak \* Ar-k acts on Fr,n, where k ≥<br>
3 and r – k ≥ 3  $rac{1}{2k(r-k)} \left( \sum_{d|k} \varphi(d) n^{\frac{k}{d}} \right) \left( \sum_{e|r-k} \varphi(e) n^{\frac{r-k}{e}} \right)$ <br>
equivalence classes.<br>
9. When Ak \* Ar-k acts on Fr,n, where k ≥ on<br>
3 and r – k ≥ 3, since Ak is isomorphic to Ak<br>
and Ar-k<br>
is isomorphic to Ar-k, A k a classes. Sr-k, Sk acts<br>  $\geq$  3, since Ak is isomorphic to Ak<br>  $\geq$  3, since Ak is isomorphic to Ak<br>  $\geq$  3, since Ak is isomorphic to Ak<br>  $\geq$  5.  $\geq$  6.  $\geq$  6 9. When Ak \* Ar-k acts on Fr,n, where k ≥ on Fr,n is equivalent<br>
3 and r - k ≥ 3, since Ak is isomorphic to Ak<br>
is isomorphic to Ar-k, A k acts on Fr,n is<br>
equivalent to Ak acts on Fk,n and Ar-k acts<br>
on Fr,n is<br>
equivale

′

$$
\frac{k!(r-k)!}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t1  
n)(tr-knr-k + tr-k-2nr-k-2 + ... + t1 n).

and Ar-k  
\nis isomorphic to Ar-k, Ak acts on Fr,n is  
\nequivalent to Ak acts on Fk,n and Ar-k acts  
\non Fr,n is  
\nequivalent to Ar-k acts on Fr-k,n,  
\nrespectively. Thus, there are also 4 cases.  
\n• If 2 
$$
\nmid
$$
 k and 2  $\nmid$  r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t1 205  
\n- If 2  $\nmid$  k and 2 | r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t1 n).  
\n• If 2  $\nmid$  k and 2 | r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t2 n2).  
\n• If 2 | k and 2  $\nmid$  r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t2 n2 4.1)  
\n• If 2 | k and 2 | r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t2 n2 4.1)  
\n• If 2 | k and 2 | r – k, then the number of  
\nequivalence classes are  
\n
$$
\frac{4}{k!(r-k)!}
$$
 (tk nk + tk-2nk-2 + ... + t2 n2 2  
\n)(tr-knr-k + tr-k-2nr-k-2 + ... + t2 n2 2 2  
\n)(tr-knr-k + tr-k-2nr-k-2 + ... + t2 n2).  
\n10. When Sk ∗ S, Sr-k acts on Fr.n. since Sk is 81

• If 2 | k and 2 | r – k, then the number of<br>equivalence classes are<br> $\frac{4}{k!(r-k)!}$  (tk nk + tk-2nk-2 + ... + t2 n2<br>)(tr-knr-k + tr-k-2nr-k-2 + ... + t2 n2).<br>10. When Sk \*...Sr-k acts on Fr,n, since Sk is<br>isomorphic to Sk

D2r-2k is isomorphic<br>
to D2r-2k, similarly, there are 2 cases<br>
depending on parity of r – k.•<br>
(e)  $n^{\frac{r-k}{e}} + (r-k)n^{\frac{r-k+1}{2}}$ <br>
<br>  $\left(\frac{k}{r} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}\right)$ <br>
Sr-k, Sk acts<br>
on Fr,n is equivale D2r-2k is isomorphic<br>to D2r-2k, similarly, there are 2 cases<br>depending on parity of  $r - k$ .<br>(e)  $n^{\frac{r-k}{e}} + (r-k)n^{\frac{r-k+1}{2}}$ <br> $\left.\begin{pmatrix} \frac{-k}{2} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}} \end{pmatrix}$ <br>Sr-k, Sk acts<br>on Fr,n is equivale  $Sr-k$  acts on Fr,n is equivalent to  $Sr-k$  acts on o D2r-2k, similarly, there are 2 cases<br>
epending on parity of r - k.•<br>  $\left(\frac{r-k}{n} + (r-k)n^{\frac{r-k+1}{2}}\right)$ <br>  $+\frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}$ <br>  $r-k$ , Sk acts<br>
n Fr,n is equivalent to Sk acts on Fk,n and<br>  $r-k$  acts on depending on parity of  $r - k$ .<br>
(e)  $n^{\frac{r-k}{e}} + (r-k)n^{\frac{r-k+1}{2}}$ <br>  $\left. + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}} \right\}$ <br>
Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts (e)  $n^{\frac{r-k}{e}} + (r-k)n^{\frac{r-k+2}{2}}$ <br>  $\frac{k}{e^k} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}$ <br>
Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts on<br>
Fr-k,n,<br>
respectively. Th  $\left(\frac{x-k+2}{2} + \frac{r-k}{2}n^{\frac{r-k}{2}}\right)$ <br>
ts<br>
equivalent to Sk acts on Fk,n and<br>
n Fr,n is equivalent to Sr-k acts on<br>
. Therefore, there are<br>
(tk nk + tk-1nk-1 + ... + t1<br>
+ tr-k-1nr-k-1 + ... + t1 n)<br>
classes.<br>
2. If r = 7,  $\frac{1}{k} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}$ <br>
Sr–k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr–k acts on Fr,n is equivalent to Sr–k acts on<br>
Fr–k,n,<br>
respectively. Therefore, there are<br>  $\frac{1}{k!(r-k)!}$  (  $\frac{e^k}{2} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}$ <br>
Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts on<br>
Fr-k,n,<br>
respectively. Therefore, there are<br>  $\frac{1}{k!(r-k)!}$  $\frac{f^{\pm}}{2} + \frac{r - k}{2} n^{\frac{r - k + 2}{2}} + \frac{r - k}{2} n^{\frac{r - k}{2}}$ <br>
Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts on<br>
Fr-k,n,<br>
respectively. Therefore, there are<br>  $\frac{1}{$  $\frac{1-k}{k} + \frac{r-k}{2}n^{\frac{r-k+2}{2}} + \frac{r-k}{2}n^{\frac{r-k}{2}}$ <br>Sr-k, Sk acts<br>on Fr,n is equivalent to Sk acts on Fk,n a<br>Sr-k acts on Fr,n is equivalent to Sr-k acts<br>Fr-k,n,<br>respectively. Therefore, there are<br> $\frac{1}{k!(r-k)!}$  (tk nk + tk Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts on<br>
Fr-k,n,<br>
respectively. Therefore, there are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-1nk-1 + ... + t1<br>
n)(tr-knr-k + tr-k-1nr Sr-k, Sk acts<br>
on Fr,n is equivalent to Sk acts on Fk,n and<br>
Sr-k acts on Fr,n is equivalent to Sr-k acts on<br>
Fr-k,n,<br>
respectively. Therefore, there are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-1nk-1 + ... + t1<br>
n)(tr-knr-k + tr-k-1nr

3 and r − k ≥ 3, since Ak is isomorphic to Ak<br>
in 2 and Ar-k<br>
is isomorphic to Ar-k, A k acts on Fr,n is<br>
equivalent to Ak acts on Fk,n and Ar-k acts<br>
on Fr,n is<br>
equivalent to Ak acts on Fk,n and Ar-k acts<br>
on Fr,n is<br> (tk nk + tk−2nk−2 + ... + t1<br>
and 2 | r equivalent to Ak acts on Fk,n and A<sup>--</sup>k acts<br>
on Fr,n is<br>
equivalent to Ar-k acts on Fr-k,n,<br>
engivalence classes.<br>
• If 2 | k and 2 | r − k, then the number of<br>  $\frac{k!(r-k)!}{k!(r-k)!}$  (tk nk + tk-2nk−2 + ... + t1<br>
2. When C7 on Fr,n is<br>
equivalent to Ar-k acts on Fr-k,n,<br>
equivalence classes.<br>
• If 2 ∤ k and 2 ∤ r − k, then the number of<br>  $\frac{k!(r-k)!}{k! (r-k)!}$  (tk nk + tk-2nk-2 + ... + t1<br>
of Taxis on F7, 8, t<br>
equivalence classes are<br>
1. When and 2  $\nmid$  r – k, then the number of<br>
and 2  $\nmid$  r – k, then the number of<br>  $\frac{1}{2}$  (tk nk + tk−2nk−2 + ... + t1<br>
and 2 | r – k, then the number of<br>  $\frac{1}{7}$  and 2 | r – k, then the number of<br>  $\frac{1}{7}$  and  $\frac{1}{2}$  equivalence classes are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk−2nk−2 + ... + t1 2097152 equivalence<br>
n)(tr-knr-k + tr-k-2nr-k-2 + ... + t1 2. When C7 acts on<br>
equivalence classes are<br>  $\frac{4}{k!(r-k)!}$  (tk nk + tk−2nk−2 + ... + t1 equiv  $\frac{1}{\sqrt{t}}$ <br>  $\frac{1}{\sqrt{t}}$ (*T* − *k*)] ((*K* n *K* + *tk*-2n*k*-2 + ... + t1<br>  $\frac{1}{2}$ (*Y* − *k*)) (*K* − *k*m+ *k* + *tk*-2n*k*-2 + ... + t1 n).<br>  $\frac{1}{2}$  2. When C7 acts on F7,8, t<br>  $\frac{1}{2}$ <br>  $\frac{1}{2}$  × (*x* and 2 and 2 | r – k, then the number of<br>  $8^{\frac{7}{4}} + \varphi(7) \times 8^{\frac{7}{2}} = \frac{1}{7} \times (1 \times 8^{\frac{7}{2}})$ <br>
(tk nk + tk−2nk−2 + ... + t1<br>  $x + \text{tr-k-2nr-k-2 + ...} + t2 n2$ ).<br>  $x + \text{tr-k-2nr-k-2 + ...} + t2 n2$ <br>  $x = 2$ <br>
(tk nk + tk−2nk−2 + ... + t2 n2<br>
(tk n equivalence classes are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk−2nk−2 + ... + t1<br>
n)(tr-knr-k + tr-k-2nr-k-2 + ... + t2 n2 ).<br>
• If 2 | k and 2 | r − k, then the number of<br>  $\frac{4}{k!(r-k)!}$  (tk nk + tk-2nk−2 + ... + t2 n2<br>  $\frac{4}{k!(r-k)!}$ 1<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-2nk-2 + ... + t1<br>
n)(tr-knr-k+tr-k-2nr-k-2 + ... + t2 n2).<br>
• If 2 | k and 2 ∤ r - k, then the number of<br>
equivalence classes are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-2nk-2 + ... + t2 n2<br>
• If 2 | k a  $k^{i}$ ( $r - k$ ): (tk nk + tk-2nk-2 + ... + tl equivalence classes.<br>
in (tr-knr-k + tr-k-2nr-k-2 + ... + t2 n2).<br>
Equivalence classes are<br>  $\frac{4}{k!(r-k)!}$  (tk nk + tk-2nk-2 + ... + t2 n2)<br>  $\frac{4}{k!(r-k)!}$  (tk nk + tk-2nk-2 + .. 2. K, SR decomposity in SR acts on Fk, n and<br>
Sr-k acts on Fr, n is equivalent to Sr-k acts on<br>
Fr-k, n,<br>
respectively. Therefore, there are<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-1nk-1 + ... + t1<br>
m)(tr-knr-k + tr-k-1nr-k-1 + ... + s equivalent to Sr-k acts on<br>
fore, there are<br>  $+$  tk-1nk-1 + ... + t1<br>  $-1$ nr-k-1 + ... + t1 n)<br>
7, k = 3 and n = 8, then we<br>
on F7,8, there are 87 =<br>
e classes.<br>
F7,8, there are<br>  $\times$  ( $\varphi(1)$   $\times$ <br>  $\frac{1}{7} \times (1 \times 8^7 +$ 1<br>  $\frac{1}{k!(r-k)!}$  (tk nk + tk-1nk-1 + ... + t1<br>
n)(tr-knr-k+tr-k-1nr-k-1 + ... + t1 n)<br>
equivalence classes.<br> **Example 3.2.** If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have that<br>
1. When I7 acts on F7,8, there are 87 =<br>
209715  $\frac{k! (r-k)!}{k! (r-kn+k+tr-k-1nr-k-1 + ... + t1)}$ <br>
n)(tr-knr-k+tr-k-1nr-k-1 + ... + t1 n)<br>
equivalence classes.<br> **Example 3.2.** If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>
have that<br>
1. When I7 acts on F7 ,8 , there are 87 =<br>
2097152 equivale u<sup>--</sup>Kili<sup>--</sup>K<sup>+</sup> u<sup>--</sup>K<sup>--</sup>Ili-<sup>-</sup>K<sup>--</sup>I + ... + 11 ii)<br>iivalence classes.<br>**ample 3.2.** If r = 7, k = 3 and n = 8, then we<br>we that<br>When I7 acts on F7,8, there are 87 =<br>97152 equivalence classes.<br>When C7 acts on F7,8, th Example 3.2. If  $r = 7$ ,  $k = 3$  and  $n = 8$ , then we<br>have that<br>1. When I7 acts on F7,8, there are 87 =<br>2097152 equivalence classes.<br>2. When C7 acts on F7,8, there are<br> $\frac{1}{7}$   $\times$  ( $\varphi(1)$   $\times$ <br> $8^{\frac{7}{4}} + \varphi(7) \times 8^{\frac{7$ **Example 3.2.** If  $T = 7$ ,  $K = 3$  and  $T = 8$ , there are 87 = 2097152 equivalence classes.<br>
1. When I7 acts on F7 ,8 , there are 87 = 2097152 equivalence classes.<br>  $\frac{1}{7}$  × ( $\varphi$ (1) ×  $8^{\frac{7}{4}} + \varphi$  (7) ×  $8^{\frac{7}{4}}$  ) 209/152 equivalence classes.<br>
2. When C7 acts on F7,8, there are<br>  $\frac{1}{7}$   $\times$  ( $\varphi$ (1)  $\times$ <br>  $8^{\frac{7}{4}} + \varphi$  (7)  $\times$   $8^{\frac{7}{7}}$  =  $\frac{1}{7}$   $\times$  (1  $\times$   $8^7 + 6 \times 8$ ) = 299600<br>
equivalence classes.<br>
3. When D14 acts 2. When C/ acts on F/, 8, there are<br>  $\frac{1}{7}$   $\times$  ( $\varphi(1)$   $\times$ <br>  $8^{\frac{7}{4}} + \varphi(7) \times 8^{\frac{7}{2}} = \frac{1}{7} \times (1 \times 8^7 + 6 \times 8) = 299600$ <br>
equivalence classes.<br>
3. When D14 acts on F7, 8, there are<br>  $\frac{1}{14} \times (\varphi(1) \times$ <br>
equiv +  $\varphi$  (7) ×  $8^{\frac{7}{7}}$  =  $\frac{1}{7}$  × (1 ×  $8^7$  + 6 × 8) = 299600<br>uivalence classes.<br>When D14 acts on F7,8, there are<br>× ( $\varphi$ (1) ×<br>uivalence classes<br>When S7 acts on F7,8, there are<br>+  $\frac{+7-1)!}{\times (8-1)!}$  = 3432<br>uivalen  $8\bar{i} + \varphi(7) \times 8\bar{i} = \frac{1}{7} \times (1 \times 8^4 + 6 \times 8) = 299$ <br>equivalence classes.<br>3. When D14 acts on F7,8, there are<br> $\frac{1}{14} \times (\varphi(1) \times$ <br>equivalence classes<br>4. When S7 acts on F7,8, there are<br> $\frac{(8+7-1)!}{7! \times (8-1)!} = 3432$ <br>equiv equivalence classes.<br>
3. When D14 acts on F7,8, there are<br>  $\frac{1}{14} \times (\varphi(1) \times$ <br>
equivalence classes<br>
4. When S7 acts on F7,8, there are<br>  $\frac{(8+7-1)!}{7! \times (8-1)!} = 3432$ <br>
equivalence classes.<br>
5. When A7 acts on F7,8, there

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**(Algoring Education**<br> **CALGONITY CONTINUMER CONSTANT OF CONSUMING CONSTANT OF CONSUMING A SURVEY ON A SURVEY OF CONSUMING A SURVEY OF CONSUMING A SURVEY CONSUMING A SURVEY CONSUMING A SURVEY CONSUMING A SURVEY CONSUMING ucation** International Conference on So<br>
and Intelligent Techno<br>
cts on F7,8, there are<br>  $(φ(1) × 8<sup>\frac{4}{4}</sup>) =  $\frac{1}{12} × (1 × 83 + 2 × 8)$ <br>  $(φ(1) × 8<sup>\frac{4}{4}</sup> + φ(2) × 8<sup>\frac{4}{2}</sup> + φ(4))$ <br>
=183744<br>
classes.$ onal Conference on Social Development<br>and Intelligent Technology (SDIT2024)<br>=  $\frac{1}{12} \times (1 \times 83 + 2 \times 8) \times (1 \times 84 + 1 \times 82$ <br>(8)  $\binom{8^{\frac{4}{4}}}{12 \times 8}$  =  $\frac{1}{12} \times (1 \times 83 + 2 \times 8) \times (1 \times 84 + 1 \times 82 + 2 \times 8)$  $=183744$ equivalence classes. 6. When C3 \*.. C4 acts on F7, 8, there are<br>  $\frac{1}{12}$  × ( $\varphi$ (1) × 8<sup> $\frac{3}{4}$ </sup> +  $\varphi$  (3) × 8<sup> $\frac{3}{3}$ </sup> × ( $\varphi$  (1) × 8<sup> $\frac{4}{4}$ </sup> +  $\varphi$  (2) × 8<sup> $\frac{4}{2}$ </sup> +  $\varphi$  (4)<br>
=183744<br>
equivalence classes.<br>
7. When D6'<br> D8 acts on F7,8, there are **International Conference on S<br>
se<br>
acts on F7,8, there are<br>**  $\begin{pmatrix} 8^{\frac{4}{4}} \end{pmatrix} = \frac{1}{12} \times (1 \times 83 + 2 \times 8)$ **<br>**  $\left(\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4)\right)$ **<br>
=183744<br>
classes.<br>
.<br>
DS acts on F7,8, there are<br> \frac{1}{ International Conference on Social De**<br> **and Intelligent Technology (3**<br> **and Intelligent Technology (3**<br>
(9(1)  $\times$   $\times$   $(\frac{8}{4}) = \frac{1}{12} \times (1 \times 83 + 2 \times 8) \times (1 \times 8)$ <br>
(1)  $\times$   $8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4)$ <br>
8374 acts on F7,8, there are<br>  $\times$  (φ(1)  $\times$  +2 × 8)<br>  $(\varphi(1) \times 8^{\frac{4}{1}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4)$ <br>
=183744<br>
classes.<br>
,<br>
D8 acts on F7,8, there are<br>  $\frac{1}{48} \times (\varphi(1) \times 8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{4}} + 3 \times 8^{\frac{3+1}{2}})$ <br>  $\times (\$ x (φ(1) x  $\frac{8}{4} + \frac{1}{\varphi(2)} \times 8^{\frac{3}{2}} + \varphi(4)$ <br>
( $\varphi(1) \times 8^{\frac{3}{4}} + \varphi(2) \times 8^{\frac{3}{4}} + \varphi(4)$ <br>
=183744<br>
classes.<br>
,<br>
DS acts on F7, 8, there are<br>  $\frac{1}{48} \times (\varphi(1) \times 8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{3}} + 3 \times 8^{\frac{3+1}{2}})$ <br>  $\frac{1}{48} \times (\varphi(1) \times 8^{\frac{3}{1}} + \varphi(3) \times 8^{\frac{3}{3}} + 3 \times 8^{\frac{3+1}{2}})$ <br>  $\times (\varphi(1) \times 8^{\frac{4}{1}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4) \times 8^{\frac{4}{4}} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}})$ <br>
=  $\frac{1}{48} \times (1 \times 83 + 2 \times 81 + 3 \times 82) \times (1 \times 84 +$  $=79920$ equivalence classes. equivalence classes.<br>
7. When D6'<br>
\* D8 acts on F7, 8, there are<br>  $\frac{1}{18} \times (\varphi(1) \times 8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{4}} + 3 \times 8^{\frac{3+1}{2}})$ <br>  $\times (\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{4}} + \varphi(4) \times 8^{\frac{4}{4}} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4$  $8 + 2 \times 83 + 2 \times$ <br>=  $\frac{1}{24} \times (1 \times 83 + 2 \times 8)$ <br> $(\frac{10!}{21 \times 7!} \times \frac{11!}{4! \times 7!} =$  $\frac{1}{48} \times (\varphi(1) \times 8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{3}} + 3 \times 8^{\frac{3+1}{2}})$ <br>  $\times (\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4) \times 8^{\frac{4}{4}} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}})$ <br>  $= \frac{1}{48} \times (1 \times 83 + 2 \times 81 + 3 \times 82) \times (1 \times 84 +$  $=177216$  $\times (\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4)$ <br>
=  $\frac{1}{48} \times (1 \times 83 + 2 \times 81 + 3 \times 8$ <br>
82)<br>
= 79920<br>
equivalence classes.<br>
8. When C3 \* D8 acts on F7,8, there are<br>  $8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{3}} \times (\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2)$  $\times (\text{e}^{(1)} \times \text{e}^{(1)} \times \text{e}^{(1)})$ <br>  $= \frac{1}{48} \times (1 \times 83 + 2 \times 81 + 3 \times 82) \times (1 \times 84 + 1 \times 82 + 2 \times 82)$ <br>
=79920<br>
equivalence classes.<br>
8. When C3 \* D8 acts on F7, 8, there are<br>  $8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{2}} \times (\varphi(1) \times 8^{\frac{4$  $+30$ <br>  $+$ <sup>62</sup><br>
=79920<br>
equivalence classes.<br>
8. When C3 \* D8 acts on F7,8, there are<br>  $8^{\frac{3}{1}} + \varphi(3) \times 8^{\frac{3}{3}}$   $\times$   $(\varphi(1) \times 8^{\frac{4}{1}} + \varphi(2) \times$ <br>  $\times (1 \times 84 + 1 \times 82 + 2 \times 8 + 2 \times 83 + 2 \times$ <br>
=177216<br>
equivalence classes.<br>
9. Wh equivalence classes.<br>
8. When C3 \* D8 acts on F7,8, there are<br>  $8^{\frac{3}{1}} + \varphi(3) \times 8^{\frac{3}{3}}$   $\times (\varphi(1) \times 8^{\frac{4}{1}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4)$ <br>  $\times (1 \times 84 + 1 \times 82 + 2 \times 8 + 2 \times 83 + 2 \times 82)$ <br>
=177216<br>
equivalence classes.<br>
9 8. When C3 \* D8 acts on F7, 8, there are<br>  $8^{\frac{3}{4}} + \varphi(3) \times 8^{\frac{3}{3}} \times (\varphi(1) \times 8^{\frac{4}{4}} + \varphi(2) \times 8^{\frac{4}{2}} + \varphi(4) \times 8^{\frac{4}{4}} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}$ <br>  $\times (1 \times 84 + 1 \times 82 + 2 \times 8 + 2 \times 83 + 2 \times 82)$ <br>
=1 24 × (p(1) ×<br>
(3) × 8<sup>3</sup> ) × ( $\varphi$  (1) × 8<sup>4</sup> +  $\varphi$  (2) × 8<sup>4</sup> +  $\varphi$  (4) × 8<sup>4</sup> +  $\frac{4}{2}$  × 8<sup> $\pm\frac{4}{2}$ </sup> × 8<sup> $\pm\frac{4}{2}$ </sup> × 8<sup>4</sup>  $\frac{3}{2}$  ) =  $\frac{1}{24}$ <br>
84 + 1 × 82 + 2 × 8 + 2 × 83 + 2 × 82 )<br>
16<br>
lence classe 2 <br>  $\times$  (1 × 84 + 1 × 82 + 2 × 8 + 2 × 83 + 2 ×<br>  $\frac{1}{24}$  × ( $\varphi$ (1) ×<br>  $\frac{4}{4} + \frac{4}{2}$  ×  $8^{\frac{4+2}{2}} + \frac{4}{2}$  ×  $8^{\frac{4}{2}}$ ) =  $\frac{1}{24}$  × (1 × 83 + 2 × 8)<br>
6 × 83 + 11 × 82 + 6 × 81 ) =  $\frac{10!}{3!}$  × 7! ×  $\frac{1$ 39600  $\frac{1}{24} \times (\varphi(1) \times 4 + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}) = \frac{1}{24} \times (1 \times 83 + 2 \times 8)$ <br>  $6 \times 83 + 11 \times 82 + 6 \times 81 = \frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7!} = 39600$ <br>
equivalence classes.<br> **Example 3.3.** If  $r = 8$ ,  $k = 3$  and  $n$  $\frac{1}{4} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}$  =  $\frac{1}{24} \times (1 \times 83 + 2 \times 8)$ <br>
6 × 83 + 11 × 82 + 6 × 81 ) =  $\frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7!}$  = 39600<br>
equivalence classes.<br> **Example 3.3.** If r = 8, k = 3 and n = 3,  $\frac{1}{4}$  +  $\frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}$  =  $\frac{1}{24} \times (1 \times 83 + 2 \times 6 \times 83 + 11 \times 82 + 6 \times 81) = \frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7}$ <br>39600<br>equivalence classes.<br>**Example 3.3.** If r = 8, k = 3 and n = 3, then<br>have th  $\frac{1}{4}$  +  $\frac{4}{2}$  ×  $8^{\frac{4+2}{2}}$  +  $\frac{4}{2}$  ×  $8^{\frac{4}{2}}$  ) =  $\frac{1}{24}$  × (1 × 83 + 2 × 8)<br>
6 × 83 + 11 × 82 + 6 × 81 ) =  $\frac{10!}{3!}$  × 7! ×  $\frac{11!}{4!}$  × 7! =<br>
39600<br>
equivalence classes.<br> **Example 3.3.** If r =  $\frac{1}{24} \times (\varphi(1) \times$ <br>  $\frac{4}{4} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}\bigg) = \frac{1}{24} \times (1 \times 83 + 2 \times 8)$ <br>
6 × 83 + 11 × 82 + 6 × 81 ) =  $\frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7!}$  =<br>
39600<br>
equivalence classes.<br> **Example 3.3.** If r  $24 \times (\varphi(1) \times$ <br>  $\frac{4}{4} + \frac{4}{2} \times 8^{\frac{4+2}{2}} + \frac{4}{2} \times 8^{\frac{4}{2}}) = \frac{1}{24} \times (1 \times 83 + 2 \times 8)$ <br>  $6 \times 83 + 11 \times 82 + 6 \times 81$   $= \frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7!} =$ <br>
39600<br>
equivalence classes.<br> **Example 3.3.** If  $r = 8$ ,  $k = 3$ 2  $J = 24 \times (1 \times 83 + 2 \times 8)$ <br>  $\times 83 + 11 \times 82 + 6 \times 81$   $= \frac{10!}{3! \times 7!} \times \frac{11!}{4! \times 7!} =$ <br>
9600<br>
quivalence classes.<br> **xample 3.3.** If  $r = 8$ ,  $k = 3$  and  $n = 3$ , then we<br>
we that<br>
When I8 acts on F8, 3, there are 38 = 656 9. When A3 \*.A4 acts on F7,8, there are<br>
4<br>  $\frac{4}{3! \times 4!} \times (1 \times 83 + 2 \times 8) \times (1 \times 84 + 11 \times 82)$ <br>
= 70400<br>
equivalence classes.<br>
10. When S3 \* S4 acts on F7,8, there are<br>  $\frac{1}{3! \times 4!} \times (1 \times 83 + 3 \times 82 + 2 \times 8) \times (1 \times 84 +$ <br> 3. At the set of  $x = 3x + 4$  and the set of  $x = 3x + 4$  and the set of  $x = 3x + 4$  be that<br>  $\frac{1}{3! \times 4! \times (1 \times 83 + 3 \times 82 + 2 \times 8) \times (1 \times 84 + 11 \times 82)}$  and the set of  $\frac{1}{3! \times 4! \times (1 \times 83 + 3 \times 82 + 2 \times 8) \times (1 \times 84 + 11 \times 84 +$ x and F7, 8, there are<br>  $\times$  82 + 2 × 8) × (1 × 84 +<br>  $\times$  82 + 2 × 8) × (1 × 84 +<br>  $\frac{1}{8}$  × (4) × 3<sup>§</sup> +  $\varphi$  (8) × 3<sup>§</sup> =  $\frac{1}{8}$  × (1 × 8<sup>§</sup> + 1 × 3<sup>4</sup> + 2 × 3<sup>2</sup> + 4<br>
1. When C8 acts on F8, 3, there are<br>  $\frac{1}{8$  $\frac{\sqrt{3}}{2}$  x 3<sup>8</sup> +  $\varphi$  (2) x 3<sup>8</sup> +  $\varphi$  (4) x 3<sup>8</sup> +  $\varphi$  (8) x 3<sup>8</sup> +  $\frac{1}{8}$  x (1 x 3<sup>8</sup> + 1 x 3:  $\times$  4:  $\times$  (1  $\times$  83 + 3  $\times$  82 + 2  $\times$  8)  $\times$  (1  $\times$  84 +<br>  $\frac{1}{8}$ <br>  $3^{\frac{8}{1}} + \varphi$  (2)  $\times$  3<sup> $\frac{8}{2} + \varphi$  (4)  $\times$  3<sup> $\frac{8}{4} + \varphi$  (8)  $\times$  3 $^{\frac{8}{8}}$ ) =  $\frac{1}{8}$   $\times$  (<br>
equivalence classes.<br>
3. When D1</sup></sup>  $=498$  $3^{\frac{8}{1}} + \varphi(2) \times 3^{\frac{8}{2}} + \varphi(4) \times 3^{\frac{8}{4}} + \varphi(8) \times 3^{\frac{8}{8}}$  =<br>equivalence classes.<br>3. When D16 acts on F8 ,3 , there are<br> $\frac{1}{16}$  × ( $\varphi(1)$  ×  $3^{\frac{8}{1}} + \varphi(2) \times 3^{\frac{8}{2}} + \varphi(4) \times 3^{\frac{8}{4}} + \varphi(8) \times 3^{\frac{8}{8$  $6 \times 83 + 11 \times 82 + 6 \times 81$   $= 31 \times 7! \times 4! \times 7! =$ <br>
39600<br>
equivalence classes.<br> **Example 3.3.** If  $r = 8$ ,  $k = 3$  and  $n = 3$ , then we<br>
have that<br>
1. When I8 acts on F8 ,3 , there are 38 = 6561<br>
equivalence classes.<br>
2. When 39600<br>
equivalence classes.<br> **Example 3.3.** If  $r = 8$ ,  $k = 3$  and  $n = 3$ , there that<br>
1. When I8 acts on F8 ,3 , there are 38 =<br>
equivalence classes.<br>
2. When C8 acts on F8 ,3 , there are<br>  $\frac{1}{8} \times (\varphi(1) \times$ <br>  $(1 \times 3^8 +$ Example 3.3. If  $r = 8$ ,  $k = 3$  and  $n = 3$ , then we<br>have that<br>1. When I8 acts on F8,3, there are 38 = 6561<br>equivalence classes.<br>2. When C8 acts on F8,3, there are<br> $\frac{1}{8} \times (\varphi(1) \times$ <br> $(1 \times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 83$ **Example 3.3.** If  $r = 8$ ,  $k = 3$  and  $n = 3$ , then we<br>have that<br>1. When I8 acts on F8, 3, there are  $38 = 6561$ <br>equivalence classes.<br>2. When C8 acts on F8, 3, there are<br> $\frac{1}{8} \times (\varphi(1) \times$ <br> $(1 \times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3$ When I8 acts on F8, 3, there are  $38 = 6561$ <br>uivalence classes.<br>When C8 acts on F8, 3, there are<br> $\times (\varphi(1) \times$ <br> $\times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 834$ <br>When S8 acts on F8, 3, there are<br> $\frac{(3+8-1)!}{3!}$ <br> $\frac{4!}{3!}$  (3 - 1)!<br>ui 2. When C8 acts on F8,3, there are 25<br>
2. When C8 acts on F8,3, there are<br>  $\frac{1}{8} \times (\varphi(1) \times$ <br>  $(1 \times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 834$ <br>
4. When S8 acts on F8,3, there are<br>  $\frac{(3 + 8 - 1)!}{= 84 \cdot 5 (3 - 1)!}$ <br>
equivalence cla 2. When C8 acts on F8,3, there are<br>  $\frac{1}{8}$  × ( $\varphi$ (1) ×<br>  $(1 \times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 834$ <br>
4. When S8 acts on F8,3, there are<br>  $\frac{(3 + 8 - 1)!}{=84 \cdot 5(3 - 1)!}$ <br>
equivalence classes.<br>
5. When A8 acts on F8,3, ther  $\frac{1}{8} \times (\varphi(1) \times$ <br>  $(1 \times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 834$ <br>
4. When S8 acts on F8,3, there are<br>  $\frac{(3+8-1)!}{-8\sqrt{4 \cdot \lambda} (3-1)!}$ <br>
equivalence classes.<br>
5. When A8 acts on F8,3, there are<br>  $\frac{2}{8!} \times (1 \times 38 + 322 \times 36 + 67$  $(1 + 2 \times 3^2 + 4 \times 3) = 834$ <br>  $(3 + 2 \times 3^2 + 4 \times 3) = 834$ <br>  $(3 + 2 \times 3^2 + 3^2)$ , there are<br>  $(22 \times 36 + 6769 \times 34 + 13068 \times 5) = 561$ <br>  $(1 \times 3^5 + 4 \times 3^1) = 561$  $\times 3^8 + 1 \times 3^4 + 2 \times 3^2 + 4 \times 3) = 834$ <br>When S8 acts on F8, 3, there are<br>  $3 + 8 - 1$ !<br>  $\frac{4 \times (3 - 1)!}{(3 - 1)!}$ <br>
uivalence classes.<br>
When A8 acts on F8, 3, there are<br>  $\times (1 \times 38 + 322 \times 36 + 6769 \times 34 + 13068 \times) = 45$ <br>
uivalence equivalence classes.<br>  $\frac{3^{\frac{3}{2}}}{16}$   $\times$  ( $\varphi(1)$ <br>  $\frac{3^{\frac{3}{2}}}{3^{\frac{3}{2}} + \varphi(2) \times 3^{\frac{3}{2}} + \varphi(4) \times 3^{\frac{3}{2}} + \varphi(8) \times 3^{\frac{3}{2}} + \frac{5}{2} \times 3^{\frac{3+2}{2}} + \frac{8}{2} \times \frac{1}{28}$ <br>  $\Rightarrow \frac{1}{3^{\frac{3}{2}}}$  =  $\frac{1}{16} \times (1 \times 38 +$ ′6  $-8$ <sup>4</sup>⋅ x (3 - 1)!<br>
equivalence classes.<br>
2<br>
2<br>
2<br>
2<br>
× (1 × 38 + 322 × 36 + 6769 × 34 + 13068 ×<br>
32 ) = 45<br>
equivalence classes.<br>
6. When C3 \* C5 acts on F8 ,3 , there are<br>  $\frac{1}{15}$  × (φ(1) ×<br>  $\frac{1}{15}$  × (1×3<sup>3</sup>+2 7. When D6'  $\frac{-845x}{-81}$  (3 – 1)!<br>equivalence classes. × (1 × 83 + 2 × 8) × (1 × 84 + 11 × 82)<br>
equivalence classes.<br>
hen S3 \* S4 acts on F7, 8, there are<br>  $\times$  (1 × 83 + 3 × 82 + 2 × 8) × (1 × 84 +<br>  $\frac{1}{3}$ <br>  $\times$  (1 × 83 + 3 × 82 + 2 × 8) × (1 × 84 +<br>  $\frac{1}{3}$ <br>  $\times$  (9(1  $\frac{3}{3}$   $\times$   $($   $\varphi$  (1)  $\times$  8<br> $\times$  82 + 2  $\times$  8 + 2<br>lasses.<br>A4 acts on F7,<br>83 + 2  $\times$  8)  $\times$  (1) 10. When S3  $*$  S4 acts on F7 ,8, there are

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$$
=\frac{1}{60} \times (1 \times 3^3 + 2 \times 3^1 + 3 \times 3^2) \times (1 \times 3^5 + 4 \times 3 + 5 \times 3^3)
$$

 $=390$ 

International Conference on Social Development and Intelligent Technology (SDIT2024)	Academic Education
and Intelligent Technology (SDIT2024)	$= \frac{1}{60} \times (1 \times 3^3 + 2 \times 3^1 + 3 \times 3^2) \times (1 \times 3^5 + 4 \times 3 + 5 \times 3^3)$ \n <p>8. When C3 * . D10 acts on F8, 3, there are equivalence classes.</p> \n <p><math display="block">\frac{1}{30} \times (\varphi(1) \times 3^{\frac{3}{4}} + \varphi(3) \times 3^{\frac{3}{3}}) \times (\varphi(1) \times 3^{\frac{5}{4}} + \varphi(5) \times 3^{\frac{5}{8}} + 5 \times 3^{\frac{5+1}{4}})</math>\n<p><math display="block">= \frac{1}{30} \times (1 \times 3^3 + 2 \times 3) \times (1 \times 3^5 + 4 \times 3 + 5 \times 3^3)</math>\n<p>fixed points of g. If this equation does not have an integer solution, g does not have an integer solution, g does not have an integer solution, g does not have an integer solution.</p>\n<p>9. When A3 * . A5 acts on F8, 3, there are equivalent. According to Lemma 2.1, when the subgroup H of Sr acts on Zm 1, ..., mn, the <math display="block">\frac{4}{3! \times 5!} \times (1 \times 3^3 + 2 \times 3^1) \times (1 \times 3^5 + 35 \times 3^3 + 24 \times 3^1) = 231</math>\n<p>equivalence classes.</p>\n<p>10. When S3 * S5 acts on F8, 3, there are equivalent, we use some special subgroups H acts on <math display="inline">\frac{1}{ H } \sum_{g \in H} \text{Fix}(g) </math>.</p>\n<p>11. When Ir acts on Zm 1, ..., mn, there are equivalence classes.</p>\n<p><math display="block">\frac{(3+3-1)!}{3! \times (3-1)!} \times \frac{(3+5-1)!}{5! \times (3-1)!} = 210</math></p>\n<p>12. When Ir acts on Zm 1, ..., mn, there are equivalence classes.</p>\n<p>13. When Ir acts on Zm 1, ..., mn, there are equivalence classes.</p>\n<p>24. The following problem is shown in the image.</p></p></p></p>

 $=429$ 

International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>  $= \frac{1}{60} \times (1 \times 3^3 + 2 \times 3^1 + 3 \times 3^1)$ <br>  $= 390$ <br>
equivalence classes.<br>  $\frac{1}{30} \times (\varphi(1) \times 3^{\frac{3}{4}} + \varphi(3) \times 3^{\frac{3}{3}}) \times$ <br>  $= \frac{1}{$  $=\frac{1}{30} \times (1 \times 3^3)$ <br>lasses.<br> $\therefore$  A5 acts on F8<br> $2 \times 3^1 \times (1 \times 3^5 + 3^5)$ lasses.<br>  $\therefore$  A5 acts on F8<br>  $-2 \times 3^1 \times (1 \times 3^5 + 3)$ <br>
lasses.<br>
\* S5 acts on F8<br>  $\times \frac{(3+5-1)!}{5! \times (3-1)!} =$ 

=390<br>
equivalence classes.<br>  $\frac{1}{30} \times (9(1) \times 3^{\frac{3}{4}} + \varphi(3) \times 3^{\frac{3}{3}}) \times$ <br>
= $\frac{1}{30} \times (9(1) \times 3^{\frac{3}{4}} + \varphi(3) \times 3^{\frac{3}{3}}) \times$ <br>
= $\frac{1}{30} \times (1 \times 3^3 + 2 \times 3) \times (1 \times 3^5 + 4$ <br>
=429<br>
equivalence classes.<br>
9. When A3 \* ·  $\frac{1}{30} \times (\varphi(1) \times 3^{\frac{1}{1}} + \varphi(3) \times 3^{\frac{1}{3}}) \times$ <br>  $= \frac{1}{30} \times (1 \times 3^3 + 2 \times 3) \times (1 \times 3^5 + 4$ <br>  $= 429$ <br>
equivalence classes.<br>
9. When A3 \*. A5 acts on F8 ,3 , there are<br>  $\frac{4}{3! \times 5!} \times (1 \times 3^3 + 2 \times 3^1) \times (1 \times 3^5 + 35$ **3.3 The Set of Some Special kind** of mappings from<br>
We can think of a special kind of mappings and  $\frac{3}{4!}$  x in the set of Some Special kind of mappings from X to Y<br>  $\frac{1}{2!}$  x (1x 3 + 3 × 3<sup>3</sup> + 2 × 3<sup>1</sup>) = 231<br> =429<br>
an integer solution,<br>
quivalence classes.<br>
4 When A3 \* A5 acts on F8,3, there are<br>  $\frac{4}{3! \times 5!} \times (1 \times 3^3 + 2 \times 3^1) \times (1 \times 3^5 + 35 \times 3^3 + 24 \times 3^1) = 231$ <br>
equivalence classes.<br>  $\frac{1}{|H|} \sum_{g \in H} |\text{Fix}(g)|$ .<br>
10. When equivalence classes.<br>
9. When A3 \* A5 acts on F8 ,3 , there are<br>  $\frac{4}{3! \times 5!} \times (1 \times 3^3 + 2 \times 3^1) \times (1 \times 3^5 + 35 \times 3^3 + 24 \times 3^1) = 231$ <br>
equivalence classes.<br>
10. When S3 \* S5 acts on F8 ,3 , there are<br>  $\frac{(3+3-1)!}{(3! \times ($ 

# X **to** Y

 $\frac{4}{3! \times 5!} \times (1 \times 3^3 + 2 \times 3^1) \times (1 \times 3^5 + 35 \times 3^3 + 24 \times 3^1) = 231$ <br>
equivalence classes.<br>  $\frac{1}{|H|} \sum_{g_1}$ <br>
equivalence classes.<br>  $\frac{(3+3-1)!}{3! \times (3-1)!} \times \frac{(3+5-1)!}{5! \times (3-1)!} = 210$ <br>
equivalence classes.<br> **3.3 The Se** 3(x) and 1)<br>
in the S3  $*$  S5 acts on F8 3, there are<br>  $\frac{(3+3-1)!}{3! \times (3-1)!} \times \frac{(3+5-1)!}{5! \times (3-1)!} = 210$ <br>  $\frac{(3+3-1)!}{5! \times (3-1)!} = 210$ <br> equivalence classes.<br>  $\frac{(3+3-1)!}{3! \times (3-1)!} \times \frac{(3+5-1)!}{5! \times (3-1)!} = 210$  Since the season of Zm on Zm and the Since of Some Special Mappings from<br>  $\begin{aligned}\n\text{3.3 The Set of Some Special Mappings from}\\ \text{At 6 V can think of a special kind of mappings}\\ \text{At 6 V can think of a special kind of mappings}\\ \text{At 6 V can think of a special kind of mappings}\\ \text{At$ 10. When S3  $*$  S3 acts on F8, 5, there are<br>  $\frac{(3+3-1)!}{3! \times (3-1)!} \times \frac{(3+5-1)!}{5! \times (3-1)!} = 210$ <br>
equivalence classes.<br>
3.3 The Set of Some Special Mappings from<br>
X to Y<br>
We can think of a special kind of mappings<br>
from X t

equivalence classes.<br>
3.3 The Set of Some Special Mappings from<br>
X to Y<br>
X to Y<br>
ach contains one element.<br>
X to Y<br>
ach contains one element.<br>
The can think of a special kind of mappings<br>  $\begin{array}{ll}\n & C_r & \text{has} & \text{up}(d) & \text{element} \\$ 3.3 The Set of Some Special Mappings from<br>  $X$  to Y<br>  $X$  to Y<br>  $X$  can think of a special kind of mappings<br>
from  $X$  to Y<br>  $X$  acts on Zm 1,...<br>
We can think of a special kind of mappings<br>  $x$  case on Zm 1,  $x$ ,  $y$  acts 3. The set of some spectal Mappings nont<br>
X to Y<br>  $\frac{1}{2}$ . When Cr acts on Zm 1,<br>
We can think of a special kind of mappings<br>  $\frac{1}{2}$  when Cr acts on Zm 1,<br>  $\frac{1}{2}$  when Cr acts on Zm 1,<br>  $\frac{1}{2}$  yns, so that  $\frac$ We can think of a special kind of mappings<br>
from X to Y with m1 y1 s, m2 y2 s, . . , mn<br>
from X to Y with m1 y1 s, m2 y2 s, . . , mn<br>  $\sum_{r=1}^{n}$  for any  $g \in C_r$  has the<br>
form of  $d^{\frac{1}{2}}$ , the corresponding D<br>
yns, so as the minus of a special since the species on Zm 1<br>
and  $\begin{array}{ll}\n\text{for } 1 \leq n \leq n \leq n \end{array}$ <br>  $\begin{array}{ll}\n\text{for } n \leq n \leq n \leq n \end{array}$  and  $r \geq n$ . The set of<br>  $\begin{array}{ll}\n\text{for } n \leq n \leq n \end{array}$ <br>  $\begin{array}{ll}\n\text{for } n \leq n \leq n \end{array}$ <br>  $\begin{array}{ll$ yns, so that  $i=1$   $\sum_{r=1}^{n}$   $\sum_{r=1}^{n}$  form of  $d^{\frac{r}{2}}$  the corresponding<br>
yns, so that  $i=1$  mi = r,<br>
mi  $\in$  N,  $i=1, 2, ..., n$  and  $r \ge n$ . The set of<br>
that  $\sum_{r=1}^{n}$  form of  $d^{\frac{r}{2}}$  the corresponding<br>
that yns, so that  $i=1$  mi = r,<br>
mi  $\in$  N,  $i = 1, 2, ..., n$  and  $r \ge n$ . The set of<br>
such permutations is Zm 1,...,mn. We can see<br>
that Zm 1,...,mn has<br>  $\frac{(m_1 + m_2 + ... + m_n)!}{m_1! m_2! \cdots m_n!}$ <br>  $\frac{m_1! m_2! \cdots m_n!}{m_1! m_2! \cdots m_n!}$ <br>  $\therefore$ equation

$$
= 1, 2, ..., r
$$
 and  $j = 1, 2, ..., n$ . If a is a fixed  
\npoint if g, then the following Diophantine  
\nequation  
\n
$$
\begin{cases}\nc_{11} + 2c_{21} + ... + rc_{r1} = m_1 \\
c_{12} + 2c_{22} + ... + rc_{r2} = m_2\n\end{cases}
$$
\n
$$
\begin{cases}\nc_{1n} + 2c_{2n} + ... + rc_{rn} = m_n \\
c_{11} + c_{12} + ... + c_{1n} = d_1 \\
c_{21} + c_{22} + ... + c_{2n} = d_2\n\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} + ... + c_{1n} = d_1 \\
c_{21} + c_{22} + ... + c_{2n} = d_2 \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{21} + c_{22} + ... + c_{2n} = d_2 \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{21} + c_{22} + ... + c_{2n} = d_2 \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{21} + c_{22} + ... + c_{2n} = d_2 \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{21} + c_{22} = m_2 \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{21} + c_{22} + ... + c_{2n} = \frac{r_1}{2}\n\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + c_{12} + ... + c_{1n} = d_r \\
\end{cases}
$$
\n
$$
\begin{cases}\nc_{11} + c_{12} + ... + c_{1n} = d_r \\
\end{cases}
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$$
\begin{cases}\nc_{11} + c_{12} + ... + c_{1n} = d_r \\
\end{cases}
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$$
\begin{cases}\nc_{11} + c_{12} + ... + c_{1n} = d_r \\
\end{cases}
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$$
\begin{cases}\nc_{11
$$

$$
\frac{d_1!}{c_{11}! \cdots c_{1n}!} \frac{d_2!}{c_{21}! \cdots c_{2n}!} \cdots \frac{d_r!}{c_{r1}! \cdots c_{rn}!}
$$

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Fig. 2.1 Academic Education<br>  $(1 \times 3^5 + 4 \times 3 + 5 \times 3^3)$ <br>
8. When C3 \*  $\cdot$  D10 acts on F8 ,3 , there are<br>  $\frac{1}{2} \times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{5}} + 5 \times 3^{\frac{5+1}{2}}$ <br>  $+ 5 \times 3^3$ <br>
fixed points of g. If this equation does n **An integral Education**<br>
(1 × 3<sup>5</sup> + 4 × 3 + 5 × 3<sup>3</sup>)<br>
8. When C3 \* · D10 acts on F8 ,3 , there are<br>
(1) × 3<sup> $\frac{5}{1}$ </sup> +  $\varphi$  (5) × 3<sup> $\frac{5}{2}$ </sup> + 5 × 3<sup> $\frac{5+1}{2}$ </sup>)<br>
+ 5 × 3<sup>3</sup>)<br>
fixed points of g. If this equation d ( $1 \times 3^5 + 4 \times 3 + 5 \times 3^3$ )<br>8. When C3 \*.. D10 acts on F8 ,3 , there are<br> $1) \times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{5}} + 5 \times 3^{\frac{5+1}{2}}$ <br> $+ 5 \times 3^3$ )<br>fixed points of g. If this equation does not have<br>an integer solution, g does not **Subseming House**<br>  $(1 \times 3^5 + 4 \times 3 + 5 \times 3^3)$ <br>
8. When C3 \*.. D10 acts on F8 ,3 , there are<br>  $(1) \times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{1}} + 5 \times 3^{\frac{5+1}{2}})$ <br>  $+ 5 \times 3^3$ <br>
fixed points of g. If this equation does not have<br>
an inte Publishing House<br>  $\times (1 \times 3^5 + 4 \times 3 + 5 \times 3^3)$ <br>
8. When C3 \*.. D10 acts on F8,3, there are<br>  $1) \times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{2}} + 5 \times 3^{\frac{5+1}{2}}$ <br>  $+ 5 \times 3^3$ <br>
fixed points of g. If this equation does not have<br>
an integer 8. When C3 \*.. D10 acts on F8 ,3 , there are<br>  $(x) \times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{5}} + 5 \times 3^{\frac{5+1}{2}}$ <br>  $+ 5 \times 3^3$ <br>
fixed points of g. If this equation does not have<br>
an integer solution, g does not have a fixed<br>
noint. Acco (a)  $\times 3^{\frac{5}{1}} + \varphi(5) \times 3^{\frac{5}{5}} + 5 \times 3^{\frac{5+1}{2}}$ <br>  $+ 5 \times 3^3$ )<br>
fixed points of g. If this equation does not have<br>
an integer solution, g does not have a fixed<br>
point. According to Lemma 2.1, when the<br>
subgroup H of 1.  $\times$  3<sup>5</sup> +  $\varphi$  (5)  $\times$  3<sup>5</sup> + 5  $\times$  3<sup>5</sup><sup>+1</sup>)<br>
+ 5  $\times$  3<sup>3</sup>)<br>
fixed points of g. If this equation does not have<br>
an integer solution, g does not have a fixed<br>
point. According to Lemma 2.1, when the<br>
subgroup H o If this equation does not have<br>
ion, g does not have a fixed<br>
g to Lemma 2.1, when the<br>
Sr acts on Zm 1,...,mn, the<br>
alence classes is<br>
ome special subgroups H acts<br>
s on Zm 1,...,mn there are<br>  $\cdots$  equivalence classes a  $+5 \times 3^3$ <br>fixed points of g. If this equation does not have<br>an integer solution, g does not have a fixed<br>point. According to Lemma 2.1, when the<br>subgroup H of Sr acts on Zm 1,...,mn, the<br>number of equivalence classes is<br> fixed points of g. If this equation does not have<br>an integer solution, g does not have a fixed<br>point. According to Lemma 2.1, when the<br>subgroup H of Sr acts on Zm 1 ,...,mn, the<br>number of equivalence classes is<br> $\frac{1}{|H|}$ an integer solution, g does not have a fixed<br>point. According to Lemma 2.1, when the<br>subgroup H of Sr acts on Zm 1,...,mn, the<br>number of equivalence classes is<br> $\frac{1}{|H|} \sum_{g \in H} |Fix(g)|$ .<br>Next, we use some special subgroups

$$
\frac{1}{|H|} \sum_{g \in H} |\text{Fix}(g)|
$$

\n- 1. When Ir acts on Zm 1, ...,mn there are 
$$
\frac{(m_1 + m_2 + \ldots + m_n)!}{m_1! m_2! m_n!}
$$
 ... equivalence classes and each contains one element.
\n- 2. When Cr acts on Zm 1, ...,mn, for any d|r, Cr has  $\varphi(d)$  elements of the form  $d^{\frac{r}{d}}$ . For any  $g \in C_r$  has the form of  $d^{\frac{r}{d}}$ , the corresponding Diophantine equation is  $\int_{dca_1}^{dca_1} = m_1$   $dc_{d2} = m_2$  ...  $dc_{dn} = m_n$   $c_{d1} + c_{d2} + \ldots + c_{dn} = \frac{r}{d}$  If mi |r, i = 1, 2, ...,n, then the Diophantine equation above has a unique integer solution and g has  $\left(\frac{r}{d}\right)!$   $\left(\frac{m_1}{d}\right)!\ldots\left(\frac{m_n}{d}\right)!$  fixed points. Otherwise, g has no fixed points. Thus, by Lemma 2.1, we obtain the number of equivalence classes.
\n- 3. When D2r acts on Zm 1, ...,mn, for any d|r, s if r is an odd integer, then there exists  $\varphi(d)$  elements of the form  $d^{\frac{r}{d}}$  and r elements of the form  $12$   $\frac{r-1}{r-1}$  in Cr. The case of the form
\n

form of  $a^a$ , the corresponding Diophantine equation is<br>  $\begin{cases}\ndc_{d1} = m_1 \\
dc_{d2} = m_2 \\
\vdots \\
c_{d1} + c_{d2} + \ldots + c_{dn} = \frac{r}{d}\n\end{cases}$ <br>
If mi  $|r, i = 1, 2,...,n$ , then the Diophantine<br>
equation above has a unique integer solution<br>
and g  $\begin{cases}\nac_{d1} = m_1 \\
dc_{d2} = m_2 \\
\ldots \\
ca_{dn} = m_n\n\end{cases}$ <br>  $c_{d1} + c_{d2} + \ldots + c_{dn} = \frac{r}{d}$ <br>
If mi  $|r$ ,  $i = 1, 2, ..., n$ , then the Diophantine<br>
equation above has a unique integer solution<br>
and g has<br>  $(\frac{r}{d})!$ <br>  $(\frac{m_1}{d})!...(\frac{m_n}{d})!$ <br>
fi  $dc_{d1} = m_n$ <br>  $c_{d1} + c_{d2} + \ldots + c_{dn} = \frac{r}{d}$ <br>
If mi  $|r$ ,  $i = 1, 2, \ldots, n$ , then the Diophantine<br>
equation above has a unique integer solution<br>
and g has<br>  $(\frac{r}{d})!$ <br>  $(\frac{m_1}{d})! \ldots (\frac{m_n}{d})!$ <br>
fixed points. Otherwise, g has n The Diophantine<br>
e integer solution<br>
as no fixed points.<br>
tain the number of<br>
..,mn, for any d|r,<br>
..e form  $d^{\frac{1}{4}}$  and r elements of the form<br>
ase of the form<br>
if g<br>
the corresponding equation above has a unique integer solution<br>and g has<br> $(\frac{r}{d})!$ <br> $(\frac{m_1}{d})!...(\frac{m_n}{d})!$ <br>fixed points. Otherwise, g has no fixed points.<br>Thus, by Lemma 2.1, we obtain the number of<br>equivalence classes.<br>3. When D2r acts on equivalence classes.<br>
3. When D2r acts on Zm 1 ,...,mn, for any d|r,<br>  $\int$ I' fr is an odd integer, then there exists  $\varphi(d)$  elements of the form  $d\frac{1}{2}$  and r elements of the form<br>  $12 \frac{r-1}{2}$  in Cr. The case of the 3. When D2r acts on Zm 1 ,...,mm, for any d|r,<br>  $\bullet$  If r is an old integer, then there exists  $q(d)$  elements of the form  $d^{\frac{r}{4}}$  and r elements of the form<br>  $12 \frac{r-1}{2}$  in Cr . The case of the form<br>  $d^{\frac{r}{4}}$  is

 $d^{\tilde{\tau}}$  is discussed previously. If g<br>has the form of  $12^{\frac{r-1}{2}}$ , then the corresponding<br>Diophantine equation is<br> $\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{12} + 2c_{22} = m_2\n\end{cases}$ ...<br> $c_{1n} + 2c_{2n} = m_n$ <br> $c_{11} + c_{12} + \ldots + c_{1n} = 1$ <br> $c_{$ 



**Conference on Solution**<br>
Thus, by Lemma 2.1, we obtain the number of<br>
equivalence classes.<br>
Thus, by Lemma 2.1, we obtain the number of<br>
equivalence classes.<br> **Conference on Solution 1.5**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ **example 12**<br> **example 12**<br> **example 12**<br> **example 12**<br> **example 12**<br> **example 12**<br> **example 122**<br> **example 122**<br> **example 122**<br> **example 122**<br> **example 122**<br> **example 122**<br> **example 122 • If the Sumple 3.4.** If  $r = 8$ , k is an even integer, then there exists  $\varphi$  (d) if  $\vec{r}$  and Intelligent Technomic classes.<br>
• If r is an even integer, then there exists  $\varphi$  (d)  $\vec{r}$  and  $m3 = 2$ , then we have e **Elements** of the form the case of the form  $\frac{r_1}{r_2}$  and  $\frac{r_2}{r_3}$  and  $\frac{r_3}{r_4}$  and  $\frac{r_4}{r_5}$  and  $\frac{r_5}{r_6}$  elements of the form  $\frac{r_2}{r_5}$  and  $\frac{r_5}{r_6}$  elements of the form  $\frac{r_6}{r_7}$  and **Problem Education**<br> **Previously. Depend to the Example 3.4.** If  $r = 8$ , k = equivalence classes.<br> **Previously.** Lemma 2.1, we obtain the number of **Example 3.4.** If  $r = 8$ , k = equivalence classes.<br> **Previously.** If is a equivalence classes.<br>
Solution above the form  $d^{\frac{7}{4}}$ , there are equents of the form  $\frac{7}{2}$  elements of the form  $\frac{1}{2}$ <br>  $\frac{7}{2}$  elements of the form  $\frac{1}{2}$ <br>  $\frac{7}{2}$  elements of the form  $\frac{1}{2}$ <br>  $\frac{7}{$ • If I'm is an even integer, then there exists  $\varphi$ (d)<br>
elements of the form  $d^{\frac{7}{4}}$ ,  $\frac{1}{3!}$  elements of the form  $d^{\frac{7}{4}}$ ,  $\frac{1}{3!}$  elements of the form  $d^{\frac{7}{4}}$ ,  $\frac{1}{3!}$  equiva<br>  $\frac{1}{2}$  elements of

Fixed points.<br>
Figures of the form  $2^{\frac{1}{2}}$ , then C8 acts on Z3<br>
previously. If g has the form of 122<br>  $\frac{1}{2}$ , then C8 acts on Z3<br>  $\frac{1}{2}$ , then C8 acts on Z3<br>  $\frac{1}{2}$ , then C8 acts on Z3<br>  $\frac{1}{2}$ , then C8 act previously. If g has the form of 122<br>  $\frac{1}{2}$ , then the corresponding Diophantine equation is<br>  $c_{11} + 2c_{21} = m_1$ <br>  $c_{12} + 2c_{22} = m_2$ <br>  $\cdots$  has an element of the form<br>  $c_{11} + c_{12} + \cdots + c_{1n} = \frac{r-2}{2}$ <br>  $\cdots$  has an

$$
c_{1n} + 2c_{2n} = m_n
$$

$$
c_{11} + c_{12} + \cdots + c_1 = 2
$$

$$
c_{11} + c_{12} + \ldots + c_{1n} = 2
$$

 $\frac{r-2}{2}$ , then the corresponding Diophantine equation is<br>  $c_{11} + 2c_{21} = m_1$ <br>  $c_{12} + 2c_{22} = m_2$ <br>  $\cdots$ <br>  $c_{1n} + 2c_{2n} = m_n$ <br>  $c_{11} + c_{12} + \cdots + c_{1n} = 2$ <br>  $c_{21} + c_{22} + \cdots + c_{2n} = \frac{r-2}{2}$ <br>
If the Diophantine equation  $\begin{cases}\nc_{11} + 2c_{21} = m_1 \\
c_{12} + 2c_{22} = m_2\n\end{cases}$   $\therefore$ <br>  $c_{1n} + 2c_{2n} = m_n$   $\therefore$ <br>  $c_{1n} + c_{2n} + \dots + c_{1n} = \frac{7-2}{2}$ (c) C8 has 2 elements of the form 4<br>  $c_{11} + c_{12} + \dots + c_{1n} = \frac{7-2}{2}$ (c) C8 has 2 elements of the form 4<br>  $\begin{cases}\nc_{12} + 2c_{22} = m_2 \\
c_{1n} + 2c_{2n} = m_n\n\end{cases}$  element has some  $-5$  element of the<br>  $c_{21} + c_{22} + \ldots + c_{1n} = 2$ <br>  $c_{11} + c_{12} + \ldots + c_{1n} = \frac{r-2}{2}$ <br>
(c) C8 has 2 elements<br>
if the Diophantine equation above has an<br>
integer  $\begin{cases}\n c_{1n} + 2c_{2n} = m_n \\
 c_{21} + c_{12} + \ldots + c_{1n} = 2 \\
 c_{21} + c_{22} + \ldots + c_{2n} = \frac{r-2}{2}\n \end{cases}$ (c) CS has 2 elements there are no fixed points.<br>
If the Diophantine equation above has an idd OS has 4 elements integer solution, th of them. By Lemma 2.1, the number of  $\begin{array}{ll}\n\begin{array}{ll}\n\text{c}_{11} + \text{c}_{12} + \dots + \text{c}_{1n} - 2 \\
\text{c}_{21} + \text{c}_{22} + \dots + \text{c}_{2n} = \frac{r-2}{2}\n\end{array}\n\end{array}$ fit the Diophantine equation above has an (d)<br>
integr solution, then g has the<br>  $\frac{2!}{(r-2)!}$ <br>  $\frac{1}{(r-2)!}$ <br>
fixed p 21  $\frac{(r-2)}{(r+1)\choose r}$   $\frac{(r-2)}{(r+1)\choose r}$   $\frac{(r-2)}{(r+2)\choose r}$   $\$  $\frac{1}{e_{11}} \cdot \cdot \cdot e_{1n}! \cdot \frac{2}{e_{21}} \cdot \cdot \cdot e_{2n}!$ <br>
fixed points. Otherwise, g has no fixed points.<br>
Thus, by Lemma 2.1, we obtain the number of<br>  $\frac{1}{8}$  x 300 = 10<br>  $\frac{1}{8}$  x 800 = 10<br>
4. When Sr acts on Zm 1,...,mn, f Fixed points. Otherwise, g has no fixed points.<br>
Thus, by Lemma 2.1, we obtain the number of<br>
equivalence classes.<br>
4. When Sr acts on Zm 1,...,mn, for any a  $\infty$ <br>
EZm 1,...,mn, there exists m1 1m2 1...mn!<br>
elements in S Thus, by Lemma 2.1, we obtain the number of<br>  $\frac{1}{5r}$  Thus, by Lemma 2.1, we obtain the number of<br>  $\frac{1}{5r}$  and  $\frac{1}{9 \epsilon 5}$  and  $\frac{1}{5}$  and  $\frac{1}{5}$  and  $\frac{1}{5}$  and  $\frac{1}{5}$  and  $\frac{1}{5}$  and  $\frac{1}{5}$  and  $\frac$ 

$$
\frac{1}{|\mathbb{S}_r|} \sum_{g \in \mathbb{S}_r} |\text{Fix}(g)| = \frac{1}{r!} \frac{r!}{m_1! \dots m_n!} (m_1! \dots m_n!) = 1.
$$

equivalence classes.<br>
4. When Sr acts on Zm 1 ,...,mn, for any a  $\infty$ <br>
Zm 1 ,...,mn, there exists m 1 !m2 !...mn!<br>
elements in Sr such that a can be a fixed point<br>
of them. By Lemma 2.1, the number of are no fixed<br>
equiv 4. When Sr acts on Zm 1,...,mn, for any a  $\infty$ <br>
Zm 1,...,mn, there exists m1 !m2 !...mn!<br>
dis element has  $\frac{8!}{3!3!2!}$  =<br>
elements in Sr such that a can be a fixed point<br>
of them. By Lemma 2.1, the number of are no fi 2. The sum of them. By Lemma 2.1, the number of<br>  $\frac{1}{|S_r|} \sum_{g \in S_r} |Fix(g)| = \frac{1}{r!} \frac{r!}{m_1!...m_n!} (m_1!...m_n!) = 1.$  (d) D16 has 2 elements of<br>
the number of them. By Lemma 2.1, the number of are no fixed points.<br>  $\frac{1}{|S_r|} \$ Example 1.  $\lim_{g \in \mathbb{S}_r}$  is the versus in that a can be a fixed point<br>of them. By Lemma 2.1, the number of are<br>equivalence classes is (c)<br> $\frac{1}{|\mathbb{S}_r|} \sum_{g \in \mathbb{S}_r} |\text{Fix}(g)| = \frac{1}{r!} \frac{r!}{m_1!...m_n!} (m_1!...m_n!) = 1.$  (d)<br>I  $\frac{1}{|\mathcal{S}_r|} \sum_{g \in \mathcal{S}_r} |\text{Fix}(g)| = \frac{1}{r!} \frac{r!}{m_1! \dots m_n!} (m_1! \dots m_n!) = 1.$ (d) D16 has 4 elements of them are no fixed points.<br>
In other words, when Sr acts on Zm 1 ,...,mn ,<br>
it only creates 1 equivalence class, and ev  $\frac{1}{|S_r|} \sum_{g \in A_r} |Fix(g)| = \frac{1}{r!} \frac{1}{m_1!...m_n!}$  (a) D16 has 4 elements<br>
In other words, when Sr acts on Zm 1,...,mn,<br>
it only creates 1 equivalence class, and every<br>
element is considered equivalent.<br>
5. When Ar acts on In other words, when Sr acts on Zm 1 ,...,mn,<br>
it only creates 1 equivalence class, and every<br>
element is considered equivalent.<br>
5. When Ar acts on Zm 1 ,...,mn, for any  $a \in \text{Thus}$ .<br>
Zm 1 ,...,mn, there exists m-1-lm224 For any subgroup H1 in Sk and subgroup H2<br>
H<sub>1</sub> in Sk and subgroup H2<br>
H<sub>1</sub> in Sk and subgroup H1 in Sk and subgroup H2<br>
H<sub>1</sub> in Sk and s

$$
\frac{1}{|A_r|} \sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1! \dots m_n!} \frac{m_1! \dots m_n!}{2} = 1.
$$

in Sr−k, when an inner direct product group<br>
Harbor Sr and this considered equivalent.<br>
S. When Ar acts on Zm 1,...,mn, for any a ∈<br>
Zm 1,...,mn, there exists <del>m-1-lm221...mn!</del><br>
declinents in Ar such that a can be a fixe 5. When Ar acts on Zm 1 ,...,mn, for any a ∈<br>
Zm 1 ,...,mn, there exists <del>m</del>-1-m221...mn+<br>
elements in Ar such that a can be a fixed point<br>
of them. By Lemma 2.1, the number of<br>  $\frac{1}{|A_r|}$  if  $\sum_{g \in A_r}$  Fix(g) =  $\frac{2}{$ Zm 1 ,...,mn, there exists m-1-ma22....mn!<br>
elements in Ar such that a can be a fixed point<br>
of them. By Lemma 2.1, the number of<br>  $\frac{1}{|A_r|} \sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1!...m_n!}$  = 1. S. When S8 acts on Z3 ,3 ,2<br>
aguiva belements in Ar such that a can be a fixed point<br>
of them. By Lemma 2.1, the number of<br>
equivalence classes.<br>
equivalence classes is<br>  $\frac{1}{|A_r|} \sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1!...m_n!} \frac{m_1!...m_n!}{2} = 1.$ <br>
S. When A8 acts on of them. By Lemma 2.1, the number of<br>
equivalence classes.<br>
equivalence classes is<br>  $\frac{1}{|A_r|} \sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1!...m_n!} \frac{m_1!...m_n!}{2} = 1.$ <br>
In other words, when A acts on Z3 ,3<br>
it only creates 1 equivalence equivalence classes is<br>  $\frac{1}{|A_r|}\sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1!...m_n!} \frac{m_1!...m_n!}{2} = 1.$ <br>
S. When A8 acts on Z3<br>
equivalence classes.<br>
In other words, when Ar acts on Zm 1,...,mm,<br>
it only creates 1 equivalence class, a  $\frac{1}{|A_r|}$   $\sum_{g \in A_r} |Fix(g)| = \frac{2}{r!} \frac{r!}{m_1!...m_n!} \frac{m_1!...m_n!}{2} = 1.$  S. When A8 acts on Z3<br>
In other words, when Ar acts on Zm 1 ,...,mm,<br>
it only creates 1 equivalence class, and every<br>
element is considered equivalen  $\frac{A_r}{|A_r|} \sum_{g \in A_r} \frac{F \log g}{|F \log g|} = \frac{F \log g}{r! \, m_1! \ldots m_n!}$ <br>
In other words, when Ar acts on Zm 1,...,mm,<br>
it only creates 1 equivalence class, and every<br>
element is considered equivalent.<br>
For any subgroup H1 in Sk and Example 12 and the number of deviations and every in the number of equivalence classes.<br>
In other words, when Ar acts on Zm 1,...,mm,<br>
in Sr-k, when an inner direct product group<br>
in Sr-k, when an inner direct product gro In other words, when AT acts of ZIIT 1,...,fm1,<br>it only creates 1 equivalence class, and every<br>element is considered equivalent.<br>For any subgroup H1 in Sk and subgroup H2<br>in Sr-k, when an inner direct product group<br>H1 \* H In other words, when Ar acts on Zm 1 ,...,mn,<br>it only creates 1 equivalence class, and every<br>element is considered equivalent.<br>For any subgroup H1 in Sk and subgroup H2<br>in Sr-k, when an inner direct product group<br>H1 \* H2

# **International Conference on Social Development and Intelligent Technology (SDIT2024)**

**Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>and **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>and  $m3 = 2$ , then we have that 1. When I8 acts<br>on  $Z_3$ ,  $3$ ,  $2$ , there are<br> $\frac{8!}{3! \times 3! \times 2!} = 560$ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3!$ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3!$ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3!$ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3!$ 

$$
\frac{8!}{\text{ol} \cdot \text{ol}} = 560
$$

**rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>
<u>8!</u><br>  $\frac$ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3!$ **element and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ , and  $m3 = 2$ , then we have that 1. When I8 acts on  $Z3$ , 3, 2, there are  $\frac{8!}{3! \times 3! \times 2!} = 560$  equivalence classes<br> **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br> **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on  $Z_3$ , 3, 2, there are<br>  $\frac{8!$ and Intelligent Technology (SDIT2024)<br>
Example 3.4. If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>
and  $m3 = 2$ , then we have that 1. When I8 acts<br>
on Z3, 3, 2, there are<br>  $\frac{8!}{3! \times 3! \times 2!} = 560$ <br>
equivalence classes<br>
2. When C8 **Example 3.4.** If  $r = 8$ ,  $k = 3$ ,  $m1 = 3$ ,  $m2 = 3$ ,<br>and  $m3 = 2$ , then we have that 1. When I8 acts<br>on Z3, 3, 2, there are<br> $\frac{8!}{3! \times 3! \times 2!} = 560$ <br>equivalence classes<br>2. When C8 acts on Z3, 3, 2, we consider the<br>followi **Example 5.4.** If  $T = 8$ ,  $K = 3$ ,  $mT = 3$ ,  $mZ = 3$ ,<br>and  $m3 = 2$ , then we have that 1. When I8 acts<br>on Z3, 3, 2, there are<br> $\frac{8!}{3! \times 3! \times 2!} = 560$ <br>equivalence classes<br>2. When C8 acts on Z3, 3, 2, we consider the<br>followi and ms – 2, then we have that 1. When 16 acts<br>on Z3, 3, 2, there are<br> $\frac{8!}{3! \times 3! \times 2!} = 560$ <br>equivalence classes<br>2. When C8 acts on Z3, 3, 2, we consider the<br>following 4 cases:<br>(a) C8 has an element of the form 18, and on  $2s$ , 3, 3, 2, there are<br>  $\frac{8!}{3! \times 3! \times 2!} = 560$ <br>
equivalence classes<br>
2. When C8 acts on Z3, 3, 2, we consider the<br>
following 4 cases:<br>
(a) C8 has an element of the form 18, and this<br>
element has  $\frac{8!}{3!3!2!} = 5$ equivalence classes<br>
2. When C8 acts on Z3,3,2, we consider the<br>
following 4 cases:<br>
(a) C8 has an element of the form 18, and this<br>
element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b) C8<br>
has an element of the form 24, bu 2. When C8 acts on Z3 ,3 ,2 , we consider the following 4 cases:<br>
(a) C8 has an element of the form 18 , and this<br>
element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b) C8<br>
has an element of the form 24 , but there are<br>
no f following 4 cases:<br>
(a) C8 has an element of the form 18, and this<br>
element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b) C8<br>
has an element of the form 24, but there are<br>
no fixed points.<br>
(c) C8 has 2 elements of the form

C8 has an element of the form 18, and this<br>nent has  $\frac{8|3|}{3|3|2!} = 560$  fixed points. (b) C8<br>an element of the form 24, but there are<br>ixed points.<br>C8 has 2 elements of the form 42, but<br>e are no fixed points.<br>C8 has 4 e element has  $31312! = 560$  fixed points. (b) C8<br>has an element of the form 24, but there are<br>no fixed points.<br>(c) C8 has 2 elements of the form 42, but<br>there are no fixed points.<br>(d) C8 has 4 elements of the form 81, but<br>t has an element of the form 24, but there are<br>no fixed points.<br>(c) C8 has 2 elements of the form 42, but<br>there are no fixed points.<br>(d) C8 has 4 elements of the form 81, but<br>there are no fixed points. Thus, there are<br> $\frac{1$ no fixed points.<br>
(c) C8 has 2 elements of the form 42, but<br>
there are no fixed points.<br>
(d) C8 has 4 elements of the form 81, but<br>
there are no fixed points. Thus, there are<br>  $\frac{1}{8} \times 560 = 70$ <br>
equivalence classes.<br>
3. (c) C8 has 2 elements of the form 42, but<br>there are no fixed points.<br>(d) C8 has 4 elements of the form 81, but<br>there are no fixed points. Thus, there are<br> $\frac{1}{8} \times 560 = 70$ <br>equivalence classes.<br>3. When D16 acts on Z3,3,2 there are no fixed points.<br>
(d) C8 has 4 elements of the form 81, but<br>
there are no fixed points. Thus, there are<br>  $\frac{1}{8} \times 560 = 70$ <br>
equivalence classes.<br>
3. When D16 acts on Z3,3,2, we consider the<br>
following 5 cases: (d) C8 has 4 elements of the form 81, but<br>there are no fixed points. Thus, there are<br> $\frac{1}{8} \times 560 = 70$ <br>equivalence classes.<br>3. When D16 acts on Z3,3,2, we consider the<br>following 5 cases:<br>(a) D16 has an element of the fo there are no fixed points. Thus, there are<br>  $\frac{1}{8} \times 560 = 70$ <br>
equivalence classes.<br>
3. When D16 acts on Z3 ,3 ,2 , we consider the<br>
following 5 cases:<br>
(a) D16 has an element of the form 18 , and<br>
this element has  $\frac{$  $\frac{1}{8} \times 560 = 70$ <br>
Sum and this deck on Z3,3,2, we consider the<br>
following 5 cases:<br>
(a) D16 has an element of the form 18, and<br>
this element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b)<br>
D16 has 5 elements of the form 24 equivalence classes.<br>
3. When D16 acts on Z3 ,3 ,2, we consider the<br>
following 5 cases:<br>
(a) D16 has an element of the form 18, and<br>
this element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b)<br>
D16 has 5 elements of the form 3. When D16 acts on Z3 ,3 ,2, we consider the<br>following 5 cases:<br>(a) D16 has an element of the form 18, and<br>this element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b)<br>D16 has 5 elements of the form 24, but there<br>are no fixed D16 has an element of the form 18, and<br>
s element has  $\frac{8!}{3!3!2!} = 560$  fixed points. (b)<br>
6 has 5 elements of the form 24, but there<br>
no fixed points.<br>
D16 has 2 elements of the form 42, but<br>
re are no fixed point<br>
D1 this element has  $\frac{8!}{3!3!2!}$  = 560 fixed points. (b)<br>
D16 has 5 elements of the form 24, but there<br>
are no fixed points.<br>
(c) D16 has 2 elements of the form 42, but<br>
there are no fixed point<br>
(d) D16 has 4 elements of

this element has  $3342 = 500$  fixed points. (b)<br>D16 has 5 elements of the form 24, but there<br>are no fixed points.<br>(c) D16 has 2 elements of the form 42, but<br>there are no fixed point<br>(d) D16 has 4 elements of the form 81, b D16 has 5 elements of the form 24, but there<br>are no fixed points.<br>(c) D16 has 2 elements of the form 42, but<br>there are no fixed point<br>(d) D16 has 4 elements of the form 81, but<br>there are no fixed points.<br>(e) D16 has 4 ele are no fixed points.<br>
(c) D16 has 2 elements of the form 42, but<br>
there are no fixed point<br>
(d) D16 has 4 elements of the form 81, but<br>
there are no fixed points.<br>
(e) D16 has 4 elements of the form 1223, and<br>
each elemen (c) D16 has 2 elements of the form 42, but<br>there are no fixed point<br>(d) D16 has 4 elements of the form 81, but<br>there are no fixed points.<br>(e) D16 has 4 elements of the form 1223, and<br>each element has  $\frac{2!}{11110!} \times \frac{3!$ (d) D16 has 4 elements of the form 81, but<br>there are no fixed points.<br>(e) D16 has 4 elements of the form 1223, and<br>each element has  $\frac{2!}{11100} \times \frac{3!}{11111} = 12$  fixed points.<br>Thus, there are<br> $\frac{1}{16} \times (1 \times 560 + 4 \times 1$ 3 4 elements of the form 81, but<br>
fixed points.<br>
4 elements of the form 1223, and<br>
t has  $\frac{3!}{1!1!0!} \times \frac{3!}{1!1!1!} = 12$  fixed points.<br>
are<br>  $0+4 \times 12 = 38$ <br>
classes.<br>
8 acts on Z3, 3, 2, there is 1<br>
classes.<br>
8 acts on hents of the form 81, but<br>
bints.<br>  $\frac{1}{10!}$  is  $\frac{3!}{11!1!1!} = 12$  fixed points.<br>
12) = 38<br>
on Z3 ,3 ,2, there is 1<br>
on Z3 ,3 ,2, there is 1<br>
for Z3 ,3 ,2, we<br>
facts on Z3 ,3 ,2, we<br>
g 4 cases:<br>
a element of the form there are no fixed points.<br>
(e) D16 has 4 elements of the form 1223, and<br>
each element has  $\frac{2!}{1110!} \times \frac{3!}{1111!} = 12$  fixed points.<br>
Thus, there are<br>  $\frac{1}{16} \times (1 \times 560 + 4 \times 12) = 38$ <br>
equivalence classes.<br>
4. When (e) D16 has 4 elements of the form 1223,<br>
each element has  $\frac{2!}{1!1!0!} \times \frac{3!}{1!1!1!} = 12$  fixed pc<br>
Thus, there are<br>  $\frac{1}{16} \times (1 \times 560 + 4 \times 12) = 38$ <br>
equivalence classes.<br>
4. When S8 acts on Z3 ,3 ,2, there<br>
equival 16 has 4 elements of the form 1223, and<br>
element has  $\frac{2!}{1110!} \times \frac{3!}{1111!} = 12$  fixed points.<br>
there are<br>
(1 × 560 + 4 × 12) = 38<br>
alence classes.<br>
hen S8 acts on Z3 ,3 ,2, there is 1<br>
alence classes.<br>
hen A8 acts o 4 elements of the form 1223, and<br>
th has  $\frac{2!}{1!1!0!} \times \frac{3!}{1!1!1!} = 12$  fixed points.<br>
are<br>  $(0 + 4 \times 12) = 38$ <br>
classes.<br>
8 acts on Z3 ,3 ,2, there is 1<br>
classes.<br>
8 acts on Z3 ,3 ,2, there is 1<br>
classes.<br>
3 \* C 5 acts

′′

each element has  $\frac{11101}{11111} = 12$  fixed points.<br>Thus, there are<br> $\frac{1}{16} \times (1 \times 560 + 4 \times 12) = 38$ <br>equivalence classes.<br>4. When S8 acts on Z3 ,3 ,2, there is 1<br>equivalence classes.<br>5. When A8 acts on Z3 ,3 ,2, there i

 $\frac{1}{16}$  × (1 × 560 + 4 × 12) = 38<br>
equivalence classes.<br>
4. When S8 acts on Z3 ,3 ,2 , there<br>
equivalence classes.<br>
5. When A8 acts on Z3 ,3 ,2 , there<br>
equivalence classes.<br>
6. When C 3 \* C 5 acts on Z3 ,3 ,2<br>
conside (1 × 560 + 4 × 12) = 38<br>
alence classes.<br>
Then S8 acts on Z3 ,3 ,2, there is 1<br>
alence classes.<br>
Then A8 acts on Z3 ,3 ,2, there is 1<br>
alence classes.<br>
Then C 3 \* C 5 acts on Z3 ,3 ,2, we<br>
der the following 4 cases:<br>
3 \* 60 + 4 × 12) = 38<br>
e classes.<br>
S8 acts on Z3 ,3 ,2, there is 1<br>
e classes.<br>
A8 acts on Z3 ,3 ,2, there is 1<br>
e classes.<br>  $\therefore$  3 \* C 5 acts on Z3 ,3 ,2, we<br>
e following 4 cases:<br>  $\therefore$  5 has an element of the form 18,<br>  $\$  $\frac{16}{16} \times (1 \times 560 + 4 \times 12) = 38$ <br>equivalence classes.<br>4. When S8 acts on Z3 ,3 ,2, there is 1<br>equivalence classes.<br>5. When A8 acts on Z3 ,3 ,2, there is 1<br>equivalence classes.<br>6. When C3 \* C5 acts on Z3 ,3 ,2, we<br>consid equivalence classes.<br>4. When S8 acts on Z3 ,3 ,2 , there<br>equivalence classes.<br>5. When A8 acts on Z3 ,3 ,2 , there<br>equivalence classes.<br>6. When C 3 \* C 5 acts on Z3 ,3 ,2<br>consider the following 4 cases:<br>(a) C 3 \* C 5 has a ′′valence classes.<br>
Then S8 acts on Z3 ,3 ,2 , there is 1<br>
valence classes.<br>
Then A8 acts on Z3 ,3 ,2 , there is 1<br>
valence classes.<br>
Then C 3 \* C 5 acts on Z3 ,3 ,2 , we<br>
der the following 4 cases:<br>  $3 \times$  C 5 has an elemen Example 1<br>
S8 acts on Z3 ,3 ,2 , there is 1<br>
e classes.<br>
A8 acts on Z3 ,3 ,2 , there is 1<br>
e classes.<br>
C3 \* C5 acts on Z3 ,3 ,2 , we<br>
e following 4 cases:<br>
C5 has an element of the form 18,<br>
ment has  $\frac{8!}{3!3!2!} = 560$  4. When S8 acts on  $23^2$ ,  $3^2$ ,  $2^2$ , there is 1<br>equivalence classes.<br>5. When A8 acts on  $23^2$ ,  $3^2$ , there is 1<br>equivalence classes.<br>6. When C3 \* C5 acts on  $23^2$ ,  $3^2$ , we<br>consider the following 4 cases:<br>(a) C3 \* equivalence classes.<br>
5. When A8 acts on Z3 ,3 ,2 , there<br>
equivalence classes.<br>
6. When C 3 \* C 5 acts on Z3 ,3 ,2<br>
consider the following 4 cases:<br>
(a) C 3 \* C 5 has an element of the form<br>
and this element has  $\frac{8!}{3$ 5. When A8 acts on Z3 , 3 , 2, there is<br>equivalence classes.<br>6. When C 3 \* C 5 acts on Z3 , 3 , 2, consider the following 4 cases:<br>(a) C 3 \* C 5 has an element of the form 1<br>and this element has  $\frac{8!}{3!3!2!} = 560$  fixed 6. When C 3 \* C 5 acts on Z3 ,3 ,2<br>consider the following 4 cases:<br>(a) C 3 \* C 5 has an element of the form<br>and this element has  $\frac{8!}{3!3!2!} = 560$  fixed poin<br>(b) C 3 \* C 5 has 4 elements of the form 1.<br>but there are no hen C 3 \* C 5 acts on Z3 ,3 ,2 , we<br>der the following 4 cases:<br>3 \* C 5 has an element of the form 18,<br>his element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>3 \* C 5 has 4 elements of the form 1351,<br>3 \* C 5 has 2 elements of t  $C_3^3$  \*  $C_5^3$  acts on Z3 ,3 ,2 , we<br>
e following 4 cases:<br>  $C_5^3$  has an element of the form 18,<br>
ennent has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
5 has 4 elements of the form 1351,<br>
5 has 2 elements of the form 1531,<br> b. when C.3  $^{\circ}$  C.3 acts on Z.3 .,3 .,2, we<br>consider the following 4 cases:<br>(a) C.3  $^{\circ}$  C.5 has an element of the form 18,<br>and this element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>(b) C.3  $^{\circ}$  C.5 has 4 elements of

# **International Conference on Social Developmen**<br> **and Intelligent Technology (SDIT2024)**<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2, we **Example 18 Section 1 Conference on Social Development**<br> **d Intelligent Technology (SDIT2024)**<br>
us, there are (d) C3 \*<br>  $\times$  (1 × 560 + 2 × 20) = 40 , but ther<br>
ivalence classes. (e) C3 \*<br>
When D6 \* D10 acts on Z3 ,3 ,2, **International Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2 , we<br>
consider the fol **International Conference on Social Development and Intelligent Technology (SDIT2024)**

Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2, we<br>
consider the following 9 cases:<br>
(a) D6 \* D'10 has an element of the form 18,

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and Intelligent Technology (SDIT2024)<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2, we<br>
consider the followin International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ , but the<br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2, we<br>
consider the **International Conference on Social Devand Intelligent Technology (SDIT2024)**<br>Thus, there are<br> $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>equivalence classes.<br>7. When D6 \* D10 acts on Z3 ,3 ,2<br>consider the following 9 cases:<br>(a) D6

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and Intelligent Technology (SDIT2024)<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ , but there are no fixed<br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2 **International Conference on Social Devand Intelligent Technology (SDIT2024)**<br>Thus, there are<br> $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>equivalence classes.<br>7. When D6 \* D10 acts on Z3 ,3 ,2<br>consider the following 9 cases:<br>(a) D6 **Intelligent Technology (SDIT2024)**<br>
(**htelligent Technology (SDIT2024)**<br>
there are<br>  $(1 \times 560 + 2 \times 20) = 40$ <br>  $(2 \times 3 \times 50) = 40$ <br>  $2 \times 3 \times 50 = 10$ <br>  $2 \times 5 \times 10 = 140$ <br>
of \* D'10 has an element of the form 18,<br>  $\frac{8!}{1!10!$ International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ , but there are<br>
equivalence classes.<br>
(e) C3 \* D'1C<br>
7. When D6 \* D10 acts on Z3 ,3

**and Intelligent Technology (SDIT2024)**<br>
Thus, there are (d) C3 \*<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ , but ther<br>
equivalence classes. (e) C3 \*<br>
7. When D6 \* D10 acts on Z3 ,3 ,2, we and each<br>
consider the following 9 cases Thus, there are<br>  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$ <br>
equivalence classes.<br>
7. When D6 \* D10 acts on Z3 ,3 ,2<br>
consider the following 9 cases:<br>
(a) D6 \* D'10 has an element of the form<br>
and this element has  $\frac{8!}{3!3!2!} =$ (d) C3 \* D'10 has 8 element Das with the form 1621<br>
(d) C3 \* D'10 has 8 element Das element D6 \* D10 acts on Z3 ,3 ,2, we<br>
der the following 9 cases:<br>
(e) C3 \* D'10 has 5 element has  $\frac{4!}{3!1!0!} \times \frac{1}{1!10!} = 40$  fixed  $\frac{1}{15} \times (1 \times 560 + 2 \times 20) = 40$  , but there are no f<br>equivalence classes. (e) C3 \* D'10 has<br>7. When D6 \* D10 acts on Z3 ,3 ,2 , we<br>consider the following 9 cases:<br>(a) D6 \* D'10 has an element of the form 18,<br>(f) C3 \* D valence classes.<br>
7hen D6 \* D10 acts on Z3 ,3 ,2 , w<br>
ider the following 9 cases:<br>
96 \* D'10 has an element of the form 18<br>
his element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
96 \* D'10 has 3 element of the form 1621<br>
eac 7. When D6 \* D10 acts on Z3 ,3 ,2 , v<br>consider the following 9 cases:<br>(a) D6 \* D'10 has an element of the form 1<br>and this element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>(b) D6 \* D'10 has 3 element of the form 162<br>and each consider the following 9 cases:<br>
(a) D6 \* D'10 has an element of the form<br>
and this element has  $\frac{8!}{3!3!2!} = 560$  fixed poin<br>
(b) D6 \* D'10 has 3 element of the form 1<br>
and each element has  $\frac{6!}{3!3!0!} \times \frac{1!}{0!0!1!$ der the following 9 cases:<br>  $+ \frac{41}{11121} \times \frac{21}{11101} = 40$  fixed is<br>
to  $\frac{6}{1112}$  b has an element of the form 18,<br>  $\frac{6!}{3!3!0!} \times \frac{11}{00!11} + \frac{6!}{3!112} \times \frac{11}{01101}$ <br>
ach element has  $\frac{6!}{3!3!0!} \times \frac{11}{00!$ (a) D6 \* D'10 has an element of the form 18,<br>
(b) D6 \* D'10 has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
(b) D6 \* D'10 has 3 element of the form 1621,<br>
and each element has  $\frac{8!}{3!3!0!} \times \frac{11}{00!11!} + \frac{6!}{3!110!} \times \frac{11}{0!$ this element has  $\frac{6!}{3!30!} \times \frac{11}{00!10!} + \frac{11}{0110!} \times \frac{11}{0110!} + \frac{11}{0110!} \times \frac{11}{0110!} + \frac{11}{0110!} \times \frac{11}{1010!} + \frac{11}{0110!} \times \frac{11}{1010!} + \frac{11}{0110!} \times \frac{11}{1010!} + \frac{11}{0110!} \times \frac{11}{1010!} + \frac{11}{0110!} \$ (b) D6 \* D'10 has 3 element of the form 16<br>
and each element has  $\frac{6!}{3!3!0!} \times \frac{1!}{0!0!1!} + \frac{6!}{3!1!2!} \times$ <br>  $+\frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) D6 \* D'10 has 2 elements of the form 1<br>
and each elem F D'10 has 3 element of the form  $1621$ <br>
in  $\frac{1}{61101} \times \frac{1}{01101} \times \frac{2}{01111} \times \frac{1}{10101} = 4$ <br>  $\times \frac{1}{10001} = 140$  fixed points.<br>  $\frac{5}{10001} = 140$  fixed points.<br>  $\frac{5}{10001} \times \frac{11}{01101} + \frac{6!}{01101} \times \frac{1}{0110$ and each element has  $\frac{5!}{0!10!} = 140$  fixed points.<br>
(c) D6 \* D'10 has 2 elements of the form 1531<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{11}{10!0!} + \frac{5!}{3!0!2!} \times \frac{1}{10!0!} + \frac{5!}{3!0!2!} \times \frac{1}{10!0!} + \frac{5!}{3!0!2!} \$ +  $\frac{13121}{13121} \times \frac{10001}{100101} = 140$  fixed points.<br>
(c) D6 \* D'10 has 2 elements of the form 15<br>
, and each element has  $\frac{5!}{0!3!2!} \times \frac{11}{11010!} + \frac{5!}{31012!}$ <br>  $\frac{11}{0110!} = 20$ <br>
fixed points.<br>
(d) D6 \* D'10

(d)  $D6 * D'10$  has 5 elements of the form 1422

(e)  $D6 * D'10$  has 15 elements of the form

(c) D6 \* D'10 has 2 elements of the form<br>
, and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5}{3!0}$ <br>  $\frac{1!}{0!1!0!} = 20$ <br>
fixed points.<br>
(d) D6 \* D'10 has 5 elements of the form<br>
, and each element has  $\frac{4!}{3!1!0!$ 5 \* D'10 has 2 elements of the form  $5*$  D'10 has 5 elements of the form  $1422$ <br>
each element has  $\frac{4!}{3!10!} \times \frac{1}{0!111} + \frac{1}{1130} \times \frac{2!}{0!111} + \frac{1}{1130} \times \frac{1}{10!0!}$ <br>
each element has  $\frac{4!}{3!10!} \times \frac{2!}{0!111} +$ and each element has  $\frac{11}{0110}$  = 20<br>
fixed points.<br>
(d) D6 \* D'10 has 5 elements of the form 1422<br>  $\frac{21}{11011} + \frac{41}{11121} \times \frac{21}{11101} = 40$  fixed points.<br>
(e) D6 \* D'10 has 15 elements of the form<br>  $\frac{21}{11011} +$ = 20<br>
l points.<br>
(a) A 3 \* A 5 has<br>
6 \* D'10 has 5 element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times$ <br>
(b) A 3 \* A 5 has<br>  $+\frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
5 \* D'10 has 15 element has  $\frac{2!}{1!10!}$ fixed points.<br>
(d) D6 \* D'10 has 5 elements of the form<br>
, and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4}{1!3}$ <br>  $\frac{2!}{1!0!1!} + \frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
(e) D 6 \* D'10 has 15 elements of t points.<br>
(a) A 3 \* A 5 has an element has  $\frac{8!}{3!3!2!}$ <br>
each element has  $\frac{2!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times$ <br>
(b) A 3 \* A 5 has 22 element has  $\frac{2!}{0!3!1!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
(c) A 3 \* A 5 (d) D6 \* D'10 has 5 elements of the form 1422<br>  $\frac{4!}{11011!} \times \frac{2!}{11110!} \times \frac{2!}{01111!}$  +  $\frac{13100}{13101} \times \frac{1}{11110}$  (b) A3<br>  $\frac{2!}{11011!} + \frac{4!}{11112!} \times \frac{2!}{11110!} = 40$  fixed points.<br>
(e) D6 \* D'10 has 15 el , and each element has  $\frac{31101}{31101} \times \frac{1}{01111} + \frac{1}{1131}$ <br>  $\frac{2!}{11011} + \frac{4!}{11110} \times \frac{2!}{11110} = 40$  fixed points.<br>
(e) D 6 \* D'10 has 15 elements of the 1<br>
1223 , and each element has  $\frac{2!}{11101} \times \frac{3!}{1111$ each element has  $\frac{3110}{11121} \times \frac{21}{11101} = 40$  fixed points.<br>  $(6 * D'10$  has 15 elements of the form  $\frac{21}{11111} = 12$ <br>
and each element has  $\frac{21}{11101} \times \frac{31}{11111} = 12$ <br>  $\frac{21}{01101} \times \frac{21}{01111} = 12$ <br>  $\frac{1}{0$  $\begin{array}{ll}\n\frac{21}{11011} + \frac{41}{11121} \times \frac{21}{11101} = 40 \text{ fixed points.} & \text{on } 1233 \text{ and each element has } \frac{21}{11101} \times \frac{31}{11111} = 12 & \text{fixed points.} \\
\text{(c) A3 } + \text{A5} \text{ has } 12 \text{ times.} & \text{(d) A3 } + \text{A5} \text{ has } \frac{21}{11111} = 12 & \text{fixed points.} \\
\text{(e) A5 } + \text{A7} \text{ has 10 elements of the form} &$ (e) D 6 \* D'10 has 15 elements of the<br>
1223, and each element has  $\frac{2!}{11110!} \times \frac{3!}{11111!}$ <br>
fixed points.<br>
(f) D 6 \* D'10 has 10 elements of the<br>
112231, and each element has  $\frac{1!}{11000!} \times \frac{1}{11}$ <br>  $\frac{1!}{0010!}$ 6 \* D'10 has 15 elements of the form<br>  $\frac{21}{10010} \times \frac{31}{11101} \times \frac{31}{10111} = 12$ <br>
13. and each element has  $\frac{21}{11001} \times \frac{31}{1111} = 12$ <br>
13. and each element has  $\frac{11}{1000} \times \frac{21}{10111} \times \frac{1}{10010} \times \frac{21}{10111$ 1223, and each element has  $\frac{2!}{11110!} \times \frac{3!}{11111!} = 12$  fixed<br>fixed points. (c) A<br>fixed points. (c) A<br>(f) D 6 \* D'10 has 10 element has  $\frac{1!}{11010!} \times \frac{2!}{11011!} \times$  point<br> $\frac{11}{0110!} + \frac{11}{0110!} \times \frac{2!}{0111!}$ 1225, and each element has  $1160 \times 1010 = 12$ <br>fixed points.<br>(f) D 6 \* D'10 has 10 elements of the form<br>112231, and each element has  $\frac{11}{10001} \times \frac{21}{10011} \times$ <br> $\frac{11}{001101} + \frac{11}{01101} \times \frac{21}{01111} \times \frac{11}{10001} = 4$ D 6 \* D'10 has 10 elements of the form<br>  $\overline{u} = \frac{1}{10101} \times \frac{2!}{011111} \times \frac{2!}{101011} = 4$  fixed points.<br>  $\overline{u} + \frac{1}{01101} \times \frac{2!}{011111} \times \frac{11}{10101} = 4$  fixed points.<br>  $\overline{u} + \frac{1}{11121} \times \frac{2!}{11101} = 4$  fixed 112231, and each element has  $\frac{1!}{1!000} \times \frac{2!}{1!0011} \times \frac{1!}{0!1!0!} \times \frac{1!}{0!1!0!} \times \frac{2!}{0!1!1!} \times \frac{2!}{0!1!0!} \times \frac{2!}{1!0!0!} = 4$  fixed points.<br>
(g) D6 \* D'10 has 4 elements of the form 1351<br>
, but there are no fix

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 $\frac{11}{01101}$  +  $\frac{21}{01101} \times \frac{21}{01111} \times \frac{11}{110101} = 4$  fixed points.<br>
(g) D6 \* D'10 has 4 elements of the form 1351<br>
but there are no fixed points.<br>
(h) D6 \* D'10 has 12 elements of the form<br>
112151, but there ar 0.110! + 0110! × 0111! × 11010! = 4 fixed points.<br>
(g) D6 \* D'10 has 4 elements of the form 1351 and each element has  $\frac{4!}{3!10!}$ , but there are no fixed points.<br>
(h) D6 \* D'10 has 12 elements of the form (e) A 3 \* A 5 (g) D6 \* D'10 has 4 elements of the form 1351 and each<br>
, but there are no fixed points.<br>
(h) D6 \* D'10 has 12 elements of the form (e) A 3<br>
112151, but there are no fixed points.<br>
(i) D6 \* D'10 has 8 elements of the form , but there are no fixed points.<br>
(h) D 6 \* D'10 has 12 elements of the<br>
112151, but there are no fixed points.<br>
(i) D6 \* D'10 has 8 elements of the form 3<br>
but there are no fixed points.<br>
Thus, there are<br>  $\frac{1}{60} \times (1 \times$ Thus, there are<br>  $\frac{1}{60}$  × (1 × 560 + 3 × 140 + 2 × 20 + 5 × 40 + 15<br>
× 12 + 10 × 4) = 24<br>
equivalence classes.<br>
8. When C3 \* D10 acts on Z3 ,3 ,2 , we<br>
consider the following 6 cases:<br>
(a) C3 \* D'10 has an element of

(h) D6 \* D'10 has 12 elements of the form<br>
(i) D6 \* D'10 has 8 elements of the form<br>
(i) D6 \* D'10 has 8 elements of the form 3151,<br>
but there are no fixed points.<br>  $\frac{1}{01101} + \frac{11}{01101} \times \frac{21}{001111} \times \frac{1}{101111} \times$ (i) D6 \* D'10 has 8 elements of the form 3<br>but there are no fixed points.<br>Thus, there are no fixed points.<br>Thus, there are<br> $\frac{1}{60} \times (1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 \times 12 + 10 \times 4) = 24$ <br>equivalence classes.<br>8. When C3 \* 5 \* D'10 has 8 elements of the form 3151,<br>
i.end each of the form 3151,<br>
there are no fixed points.<br>
there are no fixed points.<br>
there are no fixed points.<br>
(1 × 560 + 3 × 140 + 2 × 20 + 5 × 40 + 15<br>
alence classes.<br>
Thus (1) Do<sup>3</sup> D 10 has 8 elements of the form 3131,<br>  $\frac{1}{60 \times (1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 + 15)}$ <br>  $\frac{1}{60 \times (1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 + 15)}$ <br>  $\frac{1}{60 \times (1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 + 15)}$ <br>  $\frac{1}{3! \times 5!}$ <br>  $\$ i, there are<br>  $(1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 + 1 + 10 \times 4) = 24$ <br>
valence classes.<br>
Then C3 \* D10 acts on Z3 ,3 ,2 , we<br>
ider the following 6 cases:<br>  $(3 \times 5)^{2}$  T10 has an element of the form 18<br>
this element has  $\frac{8$  $\frac{1}{60} \times (1 \times 560 + 3 \times 140 + 2 \times 20 + 5 \times 40 +$ <br>  $\times 12 + 10 \times 4) = 24$ <br>
equivalence classes.<br>
8. When C3 \* D10 acts on Z3 ,3 ,2 , v<br>
consider the following 6 cases:<br>
(a) C3 \* D'10 has an element of the form 1<br>
and this elem 30 × (1 × 560 + 3 × 140 + 2 × 20 + 5 × 40 ·<br>
12 + 10 × 4) = 24<br>
equivalence classes.<br>
3. When C3 \* D10 acts on Z3 ,3 ,2<br>
consider the following 6 cases:<br>
(a) C3 \* D'10 has an element of the form<br>
and this element has  $\frac{$ 1  $\times$  500 + 3  $\times$  140 + 2  $\times$  20 + 5  $\times$  40 + 15<br>
48 elements of the form 3<br>
fixed points.<br>
hen C3 \* D10 acts on Z3 ,3 ,2 , we<br>
der the following 6 cases:<br>
3 \* D'10 has an element of the form 18,<br>  $\frac{8!}{3!3!2!} = 560$ x 12 + 10 × 4) = 24<br>
equivalence classes.<br>
8. When C3 \* D10 acts on Z3 ,3 ,2 , we<br>
consider the following 6 cases:<br>
(a) C3 \* D'10 has an element of the form 18,<br>
and this element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
(b



(d) C3 \* D'10 has 8 elements of the form<br>
, but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form 1<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times$ <sup>3</sup><br><sup>3</sup> \* D'10 has 8 elements of the form 3151<br>there are no fixed points.<br><sup>3</sup> \* D'10 has 5 elements of the form 1422,<br>ach element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ (d) C3 \* D'10 has 8 elements of the form 3151<br>
, but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!30!} \times \frac{2!}{1!0!1!} + \frac{4!}{1!1!2!}$ (d) C3 \* D'10 has 8 elements of the form<br>
, but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times$ <br>  $+ \frac{4!}{1!1!2!} \times \frac{2!}{1!10!} = 40$ **Contract Control Con Andemic Education**<br>
(d) C3 \* D'10 has 8 elements of the form 3151<br>
but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!30!} \times \frac{2!}{1!$ (d) C3 \* D'10 has 8 elements of the form 3151<br>
bublishing House<br>
(d) C3 \* D'10 has 8 elements of the form 3151<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!111!} + \frac{4!}{1!30$ 

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there are<br>  $(1 \times 560 + 2 \times 20) = 40$ <br>
alence classes.<br>
(e) C3 \* D'10 has 8 elements<br>
hen D6 \* D10 acts on Z3 ,3 ,2, we<br>
der the following 9 ca (d) C3 \* D'10 has 8 elements of the form 3,<br>
but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form 3,<br>
and each element has  $\frac{4!}{3!100} \times \frac{2!}{0!111} + \frac{4!}{1!300} \times$ <br>  $+ \frac{4!}{1!1!2!} \times \frac{2!}{1!100!} = 4$ <sup>3</sup> \* D'10 has 8 elements of the form 3151<br>
<sup>3</sup> \* D'10 has 8 elements of the form 3151<br>
<sup>41</sup> here are no fixed points.<br>
<sup>41</sup>  $\frac{2!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!30!} \times \frac{2!}{1!0!1!}$ <br>
<sup>1</sup>  $\times$   $\frac{2!}{1!10!} = 40$  fixed po (d) C3 \* D'10 has 8 elements of the form 3151<br>
the Publishing House<br>
(d) C3 \* D'10 has 8 elements of the form 3151<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!111!} + \frac{4!}{$ **Academic Education**<br>  $\therefore$  **3** \* D'10 has 8 elements of the form 3151<br>
there are no fixed points.<br>  $\frac{4!}{(3 \times 10^{11})}$  and 5 elements of the form 1422,<br>
each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2$ (d) C3 \* D'10 has 8 elements of the form 3151<br>
(e) C3 \* D'10 has 8 elements of the form 3151<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!110!} \times \frac{2!}{0!111!} + \frac{4!}{11310!} \times \frac{2!}{1101!} +$ C3 \* D'10 has 8 elements of the form 3151<br>ut there are no fixed points.<br>C3 \* D'10 has 5 elements of the form 1422,<br>d each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!111!} + \frac{4!}{1!30!} \times \frac{2!}{1!0!1!}$ <br> $\frac{4!}{1!12!} \times \frac{2!}{1!10!} =$ (d) C3 \* D'10 has 8 elements of the form 3151<br>
, but there are no fixed points.<br>
(e) C3 \* D'10 has 5 elements of the form 1422,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!} + \frac{4!}{1!1!2!$ (e) C3 \* D'10 has 5 elements of the form 1422,<br>and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!111!} + \frac{4!}{1!300} \times \frac{2!}{1!011!} + \frac{4!}{1!12!} \times \frac{2!}{1!10!} + \frac{4!}{1!12!} \times \frac{2!}{1!10!} = 40$  fixed points.<br>(f) C 3 \* D'10 has 10 0 has 5 elements of the form  $1422$ ,<br>
ment has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>  $\overline{1} = 40$  fixed points.<br>  $\frac{1}{10!0!}$  has 10 elements of the form<br>
d each element has  $\frac{1!}{1!0!0!} \times \frac{2!}{1$ bet points.<br>
elements of the form 1422,<br>  $s^{\frac{4!}{3!1!0!}} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>
xed points.<br>
10 elements of the form<br>
element has  $\frac{1!}{1!0!0!} \times \frac{2!}{1!0!1!} \times \frac{1!}{1!0!0!} = 4$  fixed points.<br>
20 (e) C3 \* D'10 has 5 elements of the form  $1422$ ,<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!300} \times \frac{2!}{1!0!1!} + \frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
(f) C 3 \* D'10 has 10 elements of the form<br> and each element has  $\frac{41}{31101} \times \frac{1}{01111} + \frac{113101}{113101} \times$ <br>  $+\frac{41}{11121} \times \frac{21}{11101} = 40$  fixed points.<br>
(f) C 3 \* D'10 has 10 elements of the<br>
112231, and each element has  $\frac{11}{110101} \times \frac{2}{110}$ <br>  $\frac{11}{$ ach element has  $\frac{31100}{31110} \times \frac{1}{01111} + \frac{11310}{13101} \times \frac{11011}{11011}$ <br>  $\frac{2!}{11110!} = 40$  fixed points.<br>  $3 * D'10$  has 10 elements of the form<br>  $31$ , and each element has  $\frac{1!}{11010!} \times \frac{2!}{11011!} \times$ <br>  $+\frac{1!$ The 40 fixed points.<br>
The 40 fixed points.<br>  $\sqrt{5!} = 40$  fixed points.<br>  $\sqrt{2!} = 40$  fixed points.<br>  $\frac{1}{2!} = 40$  fixed points of the form<br>  $\frac{2!}{\sqrt{0!11!}} \times \frac{1!}{10!0!} = 4$  fixed points.<br>  $\frac{2!}{\sqrt{0!11!}} \times \frac{1!}{10!0!}$ + 11121 × 11101 = 40 fixed points.<br>
(f) C 3 \* D'10 has 10 elements of the form<br>
112231, and each element has  $\frac{11}{11001} \times \frac{2!}{11011} \times$ <br>  $\frac{11}{01101} + \frac{11}{01101} \times \frac{2!}{01111} \times \frac{11}{11001} = 4$  fixed points.<br>
Thus, (f) C3 \* D'10 has 10 elements of the<br>
112231, and each element has  $\frac{1!}{1!0!0!} \times \frac{2}{1!0!}$ <br>  $\frac{1!}{0!1!0!} + \frac{1!}{0!1!0!} \times \frac{2!}{0!1!1!} \times \frac{1!}{1!0!0!} = 4$  fixed points.<br>
Thus, there are<br>  $\frac{1}{30} \times (1 \times 560 + 2 \times 20 + 5$ 3 \* D'10 has 10 elements of the form<br>
31 , and each element has  $\frac{1!}{1!0!0!} \times \frac{2!}{1!0!1!} \times \frac{1!}{1!0!1!} \times \frac{1!}{0!1!1!} \times \frac{2!}{0!1!1!} \times \frac{1!}{1!0!0!} = 4$  fixed points.<br>
there are<br>
(1 × 560 + 2 × 20 + 5 × 40 + 10 × 4) D'10 has 10 elements of the form<br>
and each element has  $\frac{1!}{11000} \times \frac{2!}{11011} \times \frac{2!}{10!11}$ <br>  $\frac{2!}{1111} \times \frac{1!}{110101} = 4$  fixed points.<br>
zare<br>
60 + 2 × 20 + 5 × 40 + 10 × 4) = 28<br>
e classes<br>
A 3 \* A 5 acts on Z3

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112231, and each element has  $\frac{11}{1000} \times \frac{1001}{1001} \times \frac{11}{00110} + \frac{11}{01100} \times \frac{21}{01111} \times \frac{11}{11001} = 4$  fixed points.<br>
Thus, there are<br>  $\frac{1}{30} \times (1 \times 560 + 2 \times 20 + 5 \times 40 + 10 \times 4) = 28$ <br>
equivalence classes<br>
9  $\frac{4!}{0!1!0!} + \frac{1}{0!1!0!} \times \frac{2!}{0!1!1!} \times \frac{1!}{1!0!0!} = 4$  fixed points<br>Thus, there are<br> $\frac{1}{30} \times (1 \times 560 + 2 \times 20 + 5 \times 40 + 10 \times 4)$ <br>equivalence classes<br>9. When A 3 \* A 5 acts on Z3 ,3 ,2<br>consider the following 7 case Thus, there are<br>  $\frac{1}{30} \times (1 \times 560 + 2 \times 20 + 5 \times 40 + 10 \times 4) = 2$ <br>
equivalence classes<br>
9. When A 3 \* A 5 acts on Z3 ,3 ,2 , consider the following 7 cases:<br>
(a) A 3 \* A 5 has an element of the form 1<br>
and this element ha  $\frac{1}{30} \times (1 \times 560 + 2 \times 20 + 5 \times 40 + 10 \times 4)$ <br>equivalence classes<br>9. When A 3 \* A 5 acts on Z3 ,3 ,2<br>consider the following 7 cases:<br>(a) A 3 \* A 5 has an element of the form<br>and this element has  $\frac{8!}{3!3!2!} = 560$  fixed (1 × 560 + 2 × 20 + 5 × 40 + 10 × 4) = 28<br>valence classes<br>from A 3 \* A 5 acts on Z3 ,3 ,2, we<br>der the following 7 cases:<br>3 \* A 5 has an element of the form 18,<br>his element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>3 \* A 5 ha  $60 + 2 \times 20 + 5 \times 40 + 10 \times 4$  = 28<br>
e classes<br>
A 3 \* A 5 acts on Z3 ,3 ,2, we<br>
e following 7 cases:<br>
A 5 has an element of the form 18,<br>
sment has  $\frac{8!}{3!3!2!}$  = 560 fixed points.<br>
5 has 22 elements of the form 1531,<br>
l 9. When A 3 \* A 5 acts on Z3 ,3 ,2 , we<br>
consider the following 7 cases:<br>
(a) A 3 \* A 5 has an element of the form 18,<br>
and this element has  $\frac{8!}{33!2!} = 560$  fixed points.<br>
(b) A 3 \* A 5 has 22 elements of the form 153

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consider the following 7 cases:<br>
(a) A3 \* A5 has an element of the form<br>
and this element has  $\frac{8!}{3!3!2!} = 560$  fixed poin<br>
(b) A3 \* A5 has 22 elements of the form 1<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} +$ der the following 7 cases:<br>  $3 * A5$  has an element of the form 18,<br>
his element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>  $3 * A5$  has 22 elements of the form 1531,<br>
ach element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \$ if the following 7 cases:<br>
A 5 has an element of the form 18,<br>
spectra and the form 1531,<br>
5 has 22 elements of the form  $1531$ ,<br>
lement has  $\frac{5!}{0312!} \times \frac{1!}{1100!} + \frac{5!}{3102!} \times \frac{1!}{0110!}$ <br>
S.<br>
5.<br>
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5.<br>
5.<br>
5.<br> (a) A 3 \* A 5 has an element of the form 18,<br>
and this element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
(b) A 3 \* A 5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{11}{1100!} + \frac{5!}{3102!} \times \frac{11$ and this element has  $\frac{8!}{3!3!2!} = 560$  fixed points.<br>
(b) A3 \* A5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>  $= 20$ <br>
fixed points.<br>
(c) A3 \* A5 (b) A3 \* A5 has 22 elements of the form 1<br>and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times$ <br>= 20<br>fixed points.<br>(c) A3 \* A5 has 40 elements of the form 1<br>and each element has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!}$  $8 * A5$  has 22 elements of the form  $1531$ ,<br>
ch element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>
points.<br>
\* A5 has 40 elements of the form  $1232$ ,<br>
ach element has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$  as 22 elements of the form 1531,<br>
nent has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>
as 40 elements of the form 1232,<br>
ment has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$  fixed<br>
as 15 elements of the form 1422,<br> and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>  $= 20$ <br>
fixed points.<br>
(c) A3 \* A5 has 40 elements of the form 1232,<br>
and each element has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$  fixed<br>
points. 1 points.<br>  $3 * A5$  has 40 elements of the form 1232,<br>
each element has  $\frac{2!}{00!2!} \times \frac{2!}{11!0!} = 2$  fixed<br>
ts.<br>  $3 * A5$  has 15 elements of the form 1422,<br>
each element has  $\frac{4!}{3!10!} \times \frac{2!}{0!11!} + \frac{4!}{1!30!} \times \frac{2!}{$ fixed points.<br>
(c) A3 \* A5 has 40 elements of the form 1<br>
and each element has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$ <br>
points.<br>
(d) A3 \* A5 has 15 elements of the form 1<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4$ points.<br>  $3 * A5$  has 40 elements of the form 1232,<br>
each element has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$  fixed<br>  $3 * A5$  has 15 elements of the form 1422,<br>
each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!$ <sup>15</sup> has 40 elements of the form 1232,<br>
delement has  $\frac{2!}{0!0!2!} \times \frac{2!}{1!1!0!} = 2$  fixed<br>  $\frac{4!}{0!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>
lement has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!$ (c) A3 \* A5 has 40 elements of the form 1252,<br>and each element has  $\frac{2!}{00!2!} \times \frac{2!}{1110!} = 2$  fixed<br>points.<br>(d) A3 \* A5 has 15 elements of the form 1422,<br>and each element has  $\frac{4!}{3!10!} \times \frac{2!}{0111!} + \frac{4!}{1130!} \$ From 1232,<br>  $I = 2$  fixed<br>
form 1422,<br>  $\frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>
of the form<br>  $\frac{2!}{0!} \times \frac{2!}{1!0!1!} \times$ <br>
points.<br>
form 1351,<br>  $3 * A5$  has<br>
there are no 1232,<br>fixed<br> $\frac{1422}{\frac{2!}{1!0!1!}}$ <br>form<br> $\frac{2!}{1!0!1!}$  ×<br>.<br>.<br>.<br>351,<br>5 has<br>are no and each element has  $\frac{1}{00121} \times \frac{11101}{11101} = 2$  fixed<br>points.<br>(d) A3 \* A5 has 15 elements of the form 1422,<br>and each element has  $\frac{4!}{31101} \times \frac{2!}{01111} + \frac{4!}{11301} \times \frac{2!}{11011}$ <br> $+ \frac{4!}{111121} \times \frac{2!}{11101}$ points.<br>
(d) A3 \* A5 has 15 elements of the form 142<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{1}{1!} + \frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
(e) A 3 \* A 5 has 30 elements of the form 1 (d) A3 \* A5 has 15 elements of the form 1422,<br>and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!} + \frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>(e) A 3 \* A 5 has 30 elements of the form<br>11223

there are no fixed points.<br>  $+$   $\overline{11121} \times \overline{11101} = 40$  fixed point<br>  $5 *$  D'10 has 12 elements of the form (e) A 3 \* A 5 has 30 element<br>  $5 *$  D'10 has 8 elements of the form 3151,<br>
there are no fixed points.<br>
there a 2<sup>2</sup><br>  $\times$   $\frac{2!}{1!100!}$  = 40 fixed points.<br>  $\times$   $\frac{2!}{1!100!}$  = 40 fixed points.<br>  $\frac{1!}{10!0!}$   $\times$   $\frac{2!}{10!1!}$   $\times$   $\frac{1!}{10!0!}$   $\times$   $\frac{2!}{10!1!}$   $\times$ <br>  $\frac{1!}{0!10!}$   $\times$   $\frac{2!}{0!110!}$   $\times$   $\frac{2!}{0!11$ +  $\frac{11}{11121} \times \frac{11101}{11101} = 40$  fixed points.<br>
(e) A 3 \* A 5 has 30 element has  $\frac{11}{110101} \times \frac{2!}{110111} \times \frac{1!}{011101} = \frac{1!}{011101} \times \frac{2!}{01111} \times \frac{1!}{110101} = 4$  fixed points.<br>
(f) A3 \* A5 has 24 elements (e) A 3 \* A 5 has 30 elements of the form<br>
112231, and each element has  $\frac{1!}{1!0!0!} \times \frac{2!}{1!0!1!} \times \frac{1}{0!1!0!}$ <br>  $\frac{1!}{0!1!0!} + \frac{1!}{0!1!1!} \times \frac{2!}{0!1!1!} \times \frac{1!}{1!0!0!} = 4$  fixed points.<br>
(f) A3 \* A5 has 24 elemen

112231, and each element has  $\frac{11}{10000} \times \frac{21}{11010} \times \frac{11}{01101}$ <br>  $\frac{11}{001101} + \frac{11}{011101} \times \frac{21}{01111} \times \frac{11}{110001} = 4$  fixed points.<br>
(f) A3 \* A5 has 24 elements of the form 1351,<br>
but there are no fixed p l each element has  $\frac{11}{11010!} \times \frac{21}{11011!} \times \frac{21}{11011!} \times \frac{11}{11010!} = 4$  fixed points.<br>
has 24 elements of the form 1351,<br>
no fixed points. (g) A3 \* A5 has<br>
of the form 3151, but there are no<br>
re<br>
re<br>
560 + 22 × Example 1 and  $\frac{1!}{1!0!0!}$   $\times$   $\frac{1}{1!0!1!}$   $\times$ <br>  $\frac{1}{1!0!0!}$  = 4 fixed points.<br>
lements of the form 1351,<br>
d points. (g) A3 \* A5 has<br>
orm 3151, but there are no<br>
22  $\times$  20 + 40  $\times$  2 + 15  $\times$  40<br>
<br>
22  $\times$  20  $\frac{1}{01101} + \frac{1}{01101} \times \frac{21}{01111} \times \frac{1}{10001} = 4$  fixed points.<br>
(f) A3 \* A5 has 24 elements of the form 1351,<br>
but there are no fixed points. (g) A3 \* A5 has<br>
48 elements of the form 3151, but there are no<br>
fixed p (f) A3 \* A5 has 24 elements of the form 1<br>but there are no fixed points. (g) A3 \* A4<br>48 elements of the form 3151, but there a<br>fixed points.<br>Thus, there are<br> $\frac{4}{3! \times 5! \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 + 30 \times 4) = 10$ <br>equiv 3 \* A5 has 24 elements of the form 1351,<br>
here are no fixed points. (g) A3 \* A5 has<br>
lements of the form 3151, but there are no<br>
1 points.<br>
i, there are<br>  $\overline{5!} \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40 \times 4) = 10$ <br>
valence cla <sup>5</sup> has 24 elements of the form 1351,<br>
are no fixed points. (g) A3 \* A5 has<br>
ths of the form 3151, but there are no<br>
ths.<br>
re are<br>  $1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40$ <br>  $= 10$ <br>
ce classes.<br>
1 S 3 \* S 5 acts on Z3 ,3 ,2, we but there are no fixed points. (g) A3 \* A5 has<br>48 elements of the form 3151, but there are no<br>fixed points.<br>Thus, there are<br> $\frac{4}{3! \times 5!} \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40 + 30 \times 4) = 10$ <br>equivalence classes.<br>10. When S 48 elements of the form 3151, but there and<br>fixed points.<br>Thus, there are<br> $\frac{4}{3! \times 5! \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 + 30 \times 4) = 10$ <br>equivalence classes.<br>10. When S 3 \* S 5 acts on Z3 ,3 ,2<br>consider the following 15 cases Fig. 2.1 and the form 3151, but there are no<br>
ements of the form 3151, but there are no<br>
points.<br>
, there are<br>  $\frac{1}{5!} \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40 \times 4) = 10$ <br>
valence classes.<br>
When S 3 \* S 5 acts on Z3 ,3 ,2 , w the set of the form 3151, but there are no<br>ts.<br>ts. e are<br> $1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40$ <br>= 10<br>ce classes.<br>S 3 \* S 5 acts on Z3 ,3 ,2, we<br>he following 15 cases:<br>5 has an element of the form 18, and<br> $\frac{8!}{3!3!2!} = 560$ 

fixed points.<br>
Thus, there are<br>  $\frac{4}{3! \times 5!} \times (1 \times 560 + 22 \times 20 + 40 \times 2 + 15 \times 40 + 30 \times 4) = 10$ <br>
equivalence classes.<br>
10. When S 3 \* S 5 acts on Z3 ,3 ,2, we<br>
consider the following 15 cases:<br>
(a) S3 \* S5 has an element

**Academic Education**<br> **International**<br> **Academic Education**<br> **International**<br> **and**<br>  $+ \frac{6!}{113!2!} \times \frac{1!}{110!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!3!2!} \times$ **Academic Education**<br>  $+\frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times$ <br>
= 20<br>
fixed points. ′′Academic Education<br>
Publishing House<br>  $\frac{1!}{(2! \times 1!0!0!)} = 140$  fixed points.<br>  $3 * S5$  has 22 elements of the form 1531,<br>
each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>
points. Example  $\frac{11}{000}$ <br>
Sharp House<br>  $\frac{11}{000}$  = 140 fixed points.<br>  $\frac{5}{000}$ <br>  $\frac{5}{000}$ <br>  $\frac{5!}{000} \times (9-9)!}$ <br>  $\frac{5!}{000} \times (9-9)!$ <br>  $\frac{5!}{0000}$ <br>  $\frac{5!}{0000} \times (9-9)!}$ <br>  $\frac{5!}{0000}$ <br>  $\frac{5!}{0000}$ <br>  $\frac{5!}{0000}$ <br> **Andemic Education**<br> **and International Co**<br>  $+ \frac{6!}{1!3!2!} \times \frac{11}{10!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{11}{110!0!} + \frac{5!}{3!0!2!} \times \frac{11}{0!10!}$ **Academic Education**<br>  $+\frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} = 20$ <br>
fixed points.<br>
(d) S3 \* S5 has 45 el **for Publishing House**<br>  $+ \frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 153<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1}{0!}$ <br>
= 20<br>
fixed points.<br>
(d **Academic Education**<br>  $+\frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1:<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times$ <br>
= 20<br>
fixed points.<br>
(d) S3 \* S5 ha Academic Education<br>
Publishing House<br>  $\frac{1!}{2! \times \frac{1!}{1!0!0!}} = 140$  fixed points.<br>  $3 * S5$  has 22 elements of the form 1531,<br>
ach element has  $\frac{5!}{0!3!2! \times \frac{1!}{1!0!0!}} + \frac{5!}{3!0!2! \times \frac{1!}{0!1!0!}}$ <br>
points.<br>  $3 * S5$  has **and Education**<br> **and International Co**<br> **and Int**<br>  $+\frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1531,<br>
and each element has  $\frac{6!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!$ **Academic Education**<br> **Internation:**<br>  $+\frac{6!}{1!3!2!} \times \frac{1^{11}}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1531,<br>  $\frac{9!}{9 \times 9} = 20$ <br>  $\frac{5!}{1!0!0!} \times \frac{1!}{1!10!0!} + \frac{5!}{30!2!} \times \frac{11}{0!10!}$ <br>  $=$ 

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**Publishing House**<br>  $+ \frac{6!}{1!3!2!} \times \frac{1!}{1!0!0!} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 12<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times$ <br>
= 20<br>
fixed points.<br>
(d) S3 \* S5 has ′′Academic Education<br>
Publishing House<br>  $\frac{1!}{10!0!} = 140$  fixed points.<br>  $\frac{1!}{3!0!0!} = 140$  fixed points.<br>  $\frac{1!}{3!0!0!} = \frac{5!}{5!} \times \frac{1!}{1!0!0!} + \frac{5!}{3!0!2!} \times \frac{1!}{0!1!0!}$ <br>
points.<br>  $\frac{1}{3} \times S5$  has 45 elements of From Education<br>
If and Intelligent Techn<br>
If and Intelligent Techn<br>
International Conference on Sc<br>
and Intelligent Techn<br>
International Conference on Sc<br>
and Intelligent Techn<br>
If and  $\frac{4!}{0!3!2!} \times \frac{1}{1!00!} + \frac{5!}{30$ **Example 11**<br>  $\frac{6!}{132!} \times \frac{11}{1000} = 140$  fixed points.<br>
(c) S3 \* S5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!32!} \times \frac{11}{1000} + \frac{5!}{30!2!} \times \frac{11}{0100}$ <br>  $= 20$ <br>
(d) S3 \* S5 has 45 elements o (c) S3 \* S5 has 22 elements of the form 1531,<br>
and each element has  $\frac{5!}{0!3!2!} \times \frac{1!}{11000} + \frac{5!}{30!2!} \times \frac{11}{0110!}$ <br>
= 20<br>
fixed points.<br>
(d) S3 \* S5 has 45 elements of the form 1422,<br>  $+\frac{4!}{1112!} \times \frac{2!}{1110!}$ and each element has  $\frac{1}{0!3!2!} \times \frac{1}{1!0!0!} + \frac{1}{3!0!2!} \times$ <br>  $= 20$ <br>
fixed points.<br>
(d) S3 \* S5 has 45 elements of the form 1<br>
and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times$ <br>  $+ \frac{4!}{1!1!2!} \times \frac{$ each element has  $\frac{1}{0!3!2!} \times \frac{1}{10!00!} + \frac{1}{3!0!2!} \times \frac{1}{0!10!}$ <br>
1 points.<br>  $3 * S5$  has 45 elements of the form  $1422$ ,<br>
each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!11!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>  $\frac{2!}{2!} \times \frac{1$ Example 1 as  $\frac{2}{0!0!0!} \times \frac{1}{0!10!} = 40$  fixed points.<br>
This is the form 1422, and the form 1422 and the form of the form  $\frac{21}{0!10!} \times \frac{21}{0!11!} + \frac{41}{1!30!} \times \frac{21}{10!11}$ <br>
In this case it's C9 acting c<br>
S has 1

= 20<br>
and points.<br>
(d) S3 \* S5 has 45 elements of the form  $1422$ ,<br>
and each element has  $\frac{4!}{3!10!} \times \frac{2!}{0!111} + \frac{4!}{1!300} \times \frac{2!}{1!011}$ <br>
(e) S3 \* S5 has 100 elements of the form<br>
132131, and each element has  $\frac{$ (d) S3 \* S5 has 45 elements of the form  $1422$ ,<br>and each element has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!} + \frac{4!}{1!12!} \times \frac{2!}{1!10!} = 40$  fixed points.<br>(e) S3 \* S5 has 100 elements of the form<br> $13213$ has 45 elements of the form  $1422$ ,<br>
ment has  $\frac{4!}{3!1!0!} \times \frac{2!}{0!1!1!} + \frac{4!}{1!3!0!} \times \frac{2!}{1!0!1!}$ <br>  $\overline{N}$  = 40 fixed points.<br>
5 has 100 elements of the form<br>
d each element has  $\frac{3!}{3!0!0!} \times \frac{1!}{0!0!1!} \times$ <br> 5 elements of the form  $1422$ ,<br>
has  $\frac{41}{31101} \times \frac{21}{01111} + \frac{41}{11301} \times \frac{21}{11011}$ <br>
and  $2 \times \frac{21}{11011}$ <br>
and  $2 \times \frac{21}{1011}$ <br>
bas case it's C9 acting<br>
the blowing 3 cases:<br>
the following 3 cases:<br>
(a) C9 has a 1223 and each element has  $\frac{21}{3021} \times \frac{11}{10101} = 8$  fixed points.<br>
(a) S3 \* S5 has 100 elements of the form<br>  $\frac{11}{11101} \times \frac{31}{1101} = 40$  fixed points.<br>
(a) C9 has an element of the following 3 cases:<br>  $\frac{11}{1001$ and each element has  $\frac{4!}{3!10!} \times \frac{2!}{0!11!} + \frac{4!}{1!1!2!} \times \frac{2!}{1!1!0!} = 40$  fixed points.<br>
(e) S 3 \* S 5 has 100 element has  $\frac{3!}{3!0!0!} \times \frac{1!}{0!0!1!}$ <br>  $\frac{1!}{0!1!0!} + \frac{3!}{0!3!0!} \times \frac{1!}{0!0!1!} \times \frac{1!}{1!10!0$ + 11121 × 11101 = 40 IIXed points.<br>
(e) S 3 \* S 5 has 100 element has  $\frac{3!}{3!0!0!}$  ×  $\frac{1!}{0!0!}$ <br>  $\frac{1!}{0!1!0!}$  +  $\frac{3!}{0!30!0}$  ×  $\frac{1!}{0!0!1!}$  ×  $\frac{1!}{1!0!0!}$  +  $\frac{3!}{0!1!0!}$  ×  $\frac{1!}{0!1!0!}$  ×  $\frac{1!}{1!$  $\frac{3!}{1000}$  and each element has  $\frac{3!}{3000}$  and  $\frac{1!}{00011}$  and each element has  $\frac{3!}{30001}$  and  $\frac{1!}{00011}$  and  $\frac{3!}{00011}$  and  $\frac{1!}{00011}$  and  $\frac{1!}{01000}$  +  $\frac{3!}{01101}$  and  $\frac{1!}{01100}$  and = 40 IIXed points.<br>  $\frac{11}{30001} \times \frac{11}{00011} \times \frac{1}{10001} \times \frac{1}{00111} \times \frac{1}{10001} \times \frac{1}{10011} \times \frac{1}{10001} \times \frac{$ (e) S  $3 \times 85$  has 100 elements of the form<br>  $\frac{11}{211010} + \frac{311}{01100} \times \frac{11}{01011} \times \frac{11}{110101} = 8$  fixed points.<br>
(f) S3 \* S5 has 40 element has  $\frac{21}{010021} \times \frac{11}{111010} = 2$  fixed<br>
and each element has  $\frac{21$ 31, and each element has  $\frac{2!}{10!0!} \times \frac{1!}{0!10!} = 8$  fixed points.<br>
34.  $\frac{3!}{10!0!} \times \frac{1!}{0!10!} = 8$  fixed points.<br>
35.  $\frac{3}{10!} \times \frac{1}{10!0!} = 8$  fixed points.<br>
48.  $\frac{3}{10!0!} \times \frac{1}{0!10!} = 8$  fixed points.<br>
48  $+ \frac{3!}{1!0!0!} \times \frac{1!}{0!1!0!} \times \frac{1!}{0!1!0!} = 8$  fixed points.<br>
(f) S3 \* S5 has 40 elements of the form 1<br>
and each element has  $\frac{2!}{0!0!2!} \times \frac{1!}{1!1!0!} = 2$ <br>
points. (g) S3 \* S5 has 45 elements of the form 1<br>
1223 ,  $\frac{1}{12!} \times \frac{11}{1000!} \times \frac{11}{0010!} = 8$  fixed points.<br>  $3 * S5$  has 40 elements of the form 1232,<br>  $3 * S5$  has 40 elements of the form 1232,<br>
each element has  $\frac{2!}{000!2!} \times \frac{2!}{11100} = 2$  fixed<br>
ts. (g) S3 \* S5 has 45  $\frac{11}{1000}$ <br>  $\frac{1}{1000}$  and  $\$  $+$   $\frac{17072}{1000} \times \frac{1700}{1001} \times \frac{170}{1010} = 8$  fixed points. <br>
(f) S3 \* S5 has 40 elements of the form 1232,<br>
and each element has  $\frac{2!}{0012!} \times \frac{2!}{1110!} = 2$  fixed there<br>
points. (g) S3 \* S5 has 45 elements of (i) S3 \* S5 has 40 elements of the form 1232,<br>
into each element has  $\frac{2!}{1!100} \times \frac{2!}{11110} = 2$  fixed<br>
points. (g) S3 \* S5 has 45 elements of the form<br>
into a cach element has  $\frac{2!}{1!100} \times \frac{3!}{11111} = 12$ <br>
into 22131 and each element has  $\frac{21}{1100} \times \frac{21}{11100} = 2$  fixed<br>
1223 and each element has  $\frac{21}{11100} \times \frac{21}{11111} = 12$ <br>
1223 and each element has  $\frac{21}{11100} \times \frac{31}{11111} = 12$ <br>
12231 and each element has  $\frac{11}{11$ and each element has  $\frac{11}{233}$ , and each element has  $\frac{21}{11100} \times \frac{11}{11111} = 12$  equivalence classes. In ot fixed points.<br>
(b) S3 \* S5 has 90 elements of the form  $\frac{11}{1000} \times \frac{21}{11011} \times \frac{21}{10011} \times \frac{21}{10$ 

′′

points. (g) S3 \* S5 has 45 elements of the form<br>
1223 , and each element has  $\frac{2!}{111101} \times \frac{3!}{11111} = 12$ <br>
fixed points.<br>
(h) S3 \* S 5 has 90 elements of the form<br>
112231 , and each element has  $\frac{1!}{10101} \times \frac{2!}{1$ fixed points.<br>
(h) S 3 \* S 5 has 90 elements of the form<br>  $112231$ , and each element has  $\frac{11}{1000} \times \frac{21}{10011} \times$ <br>  $\frac{11}{00101} \times \frac{21}{10011} \times$ <br>  $\frac{11}{00101} \times \frac{21}{10111} \times$ <br>
3 red beads, 3 yellow bead<br>
(i) S3 \*

points.

(i)  $33$ ,  $485$ , has 30 elements of the form 1441,<br>  $\frac{11}{900}$  +  $\frac{11}{0110}$  ×  $\frac{21}{01101}$  ×  $\frac{11}{1000}$  = 4 fixed points.<br>  $\frac{11}{1000}$  +  $\frac{21}{0110}$  ×  $\frac{21}{1100}$  = 4 fixed points.<br>
(i)  $\frac{83}{183}$ ,  $\frac{4$ 112231, and each element has  $\frac{2}{10^{110}}$  = 2 fixed points.<br>
(i) S3 \* S5 has 30 elements of the form 1441,<br>
(i) \$3, \* \$5, has 90 elements of the form classes when D18 acts<br>
there are no fixed points.<br>
(b) \$3, \* \$5, has  $\frac{1}{12101} \times \frac{1}{12101} = 2$  fixed points.<br>  $(1)$  S3 \* S5 has 30 elements of the form 1441, here are no fixed points.<br>  $(22141)$ , but there are no fixed points.<br>  $(3)$  S3, \* S5, has 90 elements of the form classes when D (i) S3 \* S5 has 30 elements of the form 1441,<br>
(i) \$3, \* §5, has 90 elements of the form<br>
(i) \$3, \* §5, has 90 elements of the form<br>
122141, but there are no fixed points.<br>
\* §5, has 60 elements of the form 113141, but<br>
t but there are no fixed points.<br>
(i) §3, \* §5, has 90 elements of the form classes when D18 act<br>
122141, but there are no fixed points. (k) §3, consider the following 4<br>
\* §5, has 60 elements of the form 113141, but (a) D1 (j) §3, \* §5, has 90 elements of the form<br>122141, but there are no fixed points. (k) §3,<br>\* §5, has 60 elements of the form 113141, but<br>there are no fixed points.<br>(l) §3, \* §5, has 40 elements of the form 2132,<br>and each el x, ou the are to fixed points. (a) 30,<br>as 60 elements of the form 113141, but<br>
and so folements of the form 113141, but<br>  $*$  (a) D18 has an element of the form  $\frac{11}{2100} = 2$  fixed<br>  $*$  S5, has 40 elements of the form where are no fixed points.<br>
there are no fixed points.<br>
(1) §3, \* §5, has 40 elements of the form 2132,<br>
(1) §3, \* §5, has 40 elements of the form 2132,<br>
points.<br>
(m) §3, \* §5, has 24 elements of the form 1351<br>
(m) §3, \* (1) §3, \* §5, has 40 elements of the form 2132<br>and each element has  $\frac{1!}{0!0!1!} \times \frac{2!}{1!1!0!} = 2$  fixe<br>points.<br>(m) §3, \* §5, has 24 elements of the form 135<br>, but there are no fixed points. (n) §3, \* §5, ha<br>72 element (i) 83, 83, has 40 clearlies of the form 2132,<br>and each element has  $\frac{1!}{0!0!1!} \times \frac{2!}{1!1!0!} = 2$  fixed<br>points.<br>(m) 83, \* 85, has 24 elements of the form 1351<br>, but there are no fixed points. (n) 83, \* 85, has<br>72 elem points.<br>
(m) §3, \* §5, has 24 elements of the form<br>
, but there are no fixed points. (n) §3, \* §<br>
72 elements of the form 112151, but the<br>
no fixed points. (o) §3, \* §5, has 48 ele<br>
of the form 3151, but there are no fixe (m) §3, \* §5, has 24 elements of the form 1351<br>
there are no fixed points.<br>
72 elements of the form 12151, but there are no fixed points.<br>
To Exements of the form 12151, but there are no fixed points.<br>
Thus, there are no but there are no fixed points. (n) §3, \* §5, has<br>
72 elements of the form 112151, but there are<br>
no fixed points. (o) §3, \* §5, has 48 elements<br>
of the form 3151, but there are no fixed points.<br>
Thus, there are<br>  $\frac{1}{3! \$ 

72 elements of the form 112151, but there are there are no fixed points. The norm of fixed points. (o) §3, \* §5, has 48 elements<br>
Thus, there are no fixed points.<br>
Thus, there are no fixed points.<br>
Thus, there are no fixe no fixed points. (o) §3, \* §5, has 48 elements<br>
of the form 3151, but there are no fixed points.<br>
Thus, there are<br>  $\frac{1}{3! \times 5! \times (1 \times 560 + 13 \times 140 + 22 \times 20 + 45 \times$ Thus, there are the interesting to  $\lambda$  the set of the s

# **Example 3**<br> **equivalence classes when C9 acts on 9 ,9 .<br>
There are<br>**  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ **<br>
equivalence classes, thus there are 40320 ways rnational Conference on Social Developme**<br> **and Intelligent Technology (SDIT202**<br>
equivalence classes when C9 acts on 9,9<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 way<br>
to arrang **International Conference on Social Development and Intelligent Technology (SDIT2024)**

and International Conference on Socialisting House<br>  $\frac{11}{000}$  = 140 fixed points.<br>
5 has 22 elements of the form 1531,<br>
Element has  $\frac{5!}{0!3!2!} \times \frac{11}{1!000} + \frac{5!}{30!2!} \times \frac{11}{0!10!}$ <br>
<br>
5 has 45 elements of the f **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
equ **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to **rnational Conference on Social Development**<br> **and Intelligent Technology (SDIT2024)**<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to **rnational Conference on Social Development**<br>
and Intelligent Technology (SDIT2024)<br>
equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to ar and Intelligent Technology (SDIT2024)<br>equivalence classes when C9 acts on 9,9.<br>There are<br> $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>equivalence classes, thus there are 40320 ways<br>to arrange 9 people in a circle.<br>2. How many necklaces c and inteingent recultions (sbF12024)<br>equivalence classes when C9 acts on 9,9.<br>There are<br> $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>equivalence classes, thus there are 40320 ways<br>to arrange 9 people in a circle.<br>2. How many necklaces ca equivalence classes when C9 acts on 9,9.<br>
There are<br>  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to arrange 9 people in a circle.<br>
2. How many necklaces can be made from 3<br>
red beads, 3 y  $\frac{9!}{9 \times (9-9)!} = 8! = 40320$ <br>
equivalence classes, thus there are 40320 ways<br>
to arrange 9 people in a circle.<br>
2. How many necklaces can be made from 3<br>
red beads, 3 yellow beads, and 3 green beads?<br>
In this case it's C9  $\frac{1}{9 \times (9-9)!} = 8! = 40320$ <br>equivalence classes, thus there are 40320 ways<br>to arrange 9 people in a circle.<br>2. How many necklaces can be made from 3<br>red beads, 3 yellow beads, and 3 green beads?<br>In this case it's C9 actin equivalence classes, thus there are 40320 ways<br>to arrange 9 people in a circle.<br>2. How many necklaces can be made from 3<br>red beads, 3 yellow beads, and 3 green beads?<br>In this case it's C9 acting on 33 ,3 ,3 . We<br>need to c to arrange 9 people in a circle.<br>
2. How many necklaces can be made from 3<br>
red beads, 3 yellow beads, and 3 green beads?<br>
In this case it's C9 acting on 33 ,3 ,3 . We<br>
need to calculate the number of equivalence<br>
classes For the is case, 3 yellow beads, and 3 getch beads!<br>
In this case it's C9 acting on 33 ,3 ,3 . We<br>
eneed to calculate the number of equivalence<br>
classes when C9 acts on 33 ,3 ,3 . We consider<br>
the following 3 cases:<br>
(a)

 $\frac{1!}{0!1!0!} + \frac{3!}{0!3!0!} \times \frac{1!}{0!0!1!} \times \frac{1!}{1!0!0!} + \frac{3!}{0!1!0!} \times \frac{1!}{1!0!0!} \times \frac{1!}{1!0!0!}$  (a) C9 has an element has  $\frac{9!}{3!3!3!} = 1680$  fixed points. (b) C9<br>+  $\frac{3!}{1!0!2!} \times \frac{1!}{1!0!0!} \times \frac{1!}{0!1!0!} =$ In this case it s  $C_7$  acting on  $33^3$ ,  $3^5$ . We<br>need to calculate the number of equivalence<br>classes when C9 acts on 33, 3, 3. We consider<br>the following 3 cases:<br>(a) C9 has an element of the form 19, and this<br>element h decall to Calculate the humber of equivalence<br>classes when C9 acts on 33, 3, 3. We consider<br>the following 3 cases:<br>(a) C9 has an element of the form 19, and this<br>element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points. (b) C9<br>has

1223, and each element has  $\frac{11}{11101} \times \frac{21}{11111} = 12$ <br>
fixed points.<br>
(h) S 3 \* S 5 has 90 elements of the form<br>
112231, and each element has  $\frac{11}{11001} \times \frac{21}{10111} \times \frac{21}{10111}$ <br>  $\frac{11}{00101} \times \frac{21}{01111} \times$ classes when C9 acts on 33,3,3. We consider<br>the following 3 cases:<br>(a) C9 has an element of the form 19, and this<br>element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points. (b) C9<br>has 2 elements of the form 33, and each<br>element has (a) C9 has an element of the form 19, and this<br>element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points. (b) C9<br>has 2 elements of the form 33, and each<br>element has  $\frac{3!}{1!1!1!}$  = 6 fixed points.<br>(c) C9 has 6 elements of the for (a) C<sub>2</sub> has an element of the form 12, and this<br>element has  $\frac{10}{313331}$  = 1680 fixed points. (b) C9<br>has 2 elements of the form 33, and each<br>element has  $\frac{31}{11111}$  = 6 fixed points.<br>(c) C9 has 6 elements of the fo element has 313131 = 1680 fixed points. (b) C9<br>has 2 elements of the form 33, and each<br>element has  $\frac{3|1|}{1|1|1|1} = 6$  fixed points.<br>(c) C9 has 6 elements of the form 91, but<br>there are no fixed points. Thus, there are<br>e has 2 elements of the form 33, and each<br>element has  $\frac{3|1|}{1|1111} = 6$  fixed points.<br>(c) C9 has 6 elements of the form 91, but<br>there are no fixed points. Thus, there are<br> $\frac{1}{9} \times (1 \times 1680 + 2 \times 6) = 188$ <br>equivalence cla element has  $\frac{17111}{111111} = 6$  fixed points.<br>
(c) C9 has 6 elements of the form 91, but<br>
there are no fixed points. Thus, there are<br>  $\frac{1}{9} \times (1 \times 1680 + 2 \times 6) = 188$ <br>
equivalence classes. In other words, there are<br>
18 (c) C9 has 6 elements of the form 91, but<br>there are no fixed points. Thus, there are<br> $\frac{1}{9} \times (1 \times 1680 + 2 \times 6) = 188$ <br>equivalence classes. In other words, there are<br>188 different kinds of necklaces which can be<br>made from there are no fixed points. Thus, there are<br>  $\frac{1}{9} \times (1 \times 1680 + 2 \times 6) = 188$ <br>
equivalence classes. In other words, there are<br>
188 different kinds of necklaces which can be<br>
made from<br>
3 red beads, 3 yellow beads, and 3 g  $\frac{1}{9} \times (1 \times 1680 + 2 \times 6) = 188$ <br>equivalence classes. In other words, there are<br>188 different kinds of necklaces which can be<br>made from<br>3 red beads, 3 yellow beads, and 3 green beads.<br>3. How many bracelets can be made fr 9<br>
equivalence classes. In other words, there are<br>
188 different kinds of necklaces which can be<br>
made from<br>
3 red beads, 3 yellow beads, and 3 green beads.<br>
3. How many bracelets can be made from 3<br>
red beads, 3 yellow b 188 different kinds of necklaces which can be<br>made from<br>3 red beads, 3 yellow beads, and 3 green beads.<br>3. How many bracelets can be made from 3<br>red beads, 3 yellow beads, and 3 green beads?<br>In this case it's D18 acting o made from<br>3 red beads, 3 yellow beads, and 3 green beads.<br>3. How many bracelets can be made from 3<br>red beads, 3 yellow beads, and 3 green beads?<br>In this case it's D18 acting on 33 ,3 ,3 . We<br>need to calculate the number o 3 red beads, 3 yellow beads, and 3 green beads.<br>3. How many bracelets can be made from 3 red beads, 3 yellow beads, and 3 green beads?<br>In this case it's D18 acting on 33, 3, 3. We<br>need to calculate the number of equivalen 3. How many bracelets can be made from 3<br>red beads, 3 yellow beads, and 3 green beads?<br>In this case it's D18 acting on 33 ,3 ,3 . We<br>need to calculate the number of equivalence<br>classes when D18 acts on 33 ,3 ,3 . We<br>consi red beads, 3 yellow beads, and 3 green beads?<br>In this case it's D18 acting on 33, 3, 3. We<br>need to calculate the number of equivalence<br>classes when D18 acts on 33, 3, 3. We<br>consider the following 4 cases:<br>(a) D18 has an e

and to calculate the number of equivalence<br>sses when D18 acts on 33 ,3 . We<br>nsider the following 4 cases:<br>D18 has an element of the form 19 , and<br>s element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points. (b)<br>8 has 2 elements of classes when D18 acts on 33 , 3 , We<br>consider the following 4 cases:<br>(a) D18 has an element of the form 19, and<br>this element has  $\frac{9!}{3!3!3!} = 1680$  fixed points. (b)<br>D18 has 2 elements of the form 33 , and each<br>element consider the following 4 cases:<br>
(a) D18 has an element of the form 19, and<br>
this element has  $\frac{9!}{3!3!3!} = 1680$  fixed points. (b)<br>
D18 has 2 elements of the form 33, and each<br>
element has  $\frac{3!}{1!11!} = 6$  fixed point (a) D18 has an element of the form 19, and<br>this element has  $\frac{9!}{3!3!3!} = 1680$  fixed points. (b)<br>D18 has 2 elements of the form 33, and each<br>element has  $\frac{3!}{1!1!1!} = 6$  fixed points.<br>(c) D18 has 6 elements of the fo

(a) 210 and an  $\frac{91}{31313!} = 1680$  fixed points. (b)<br>
D18 has 2 elements of the form 33, and each<br>
element has  $\frac{3!}{11111!} = 6$  fixed points.<br>
(c) D18 has 6 elements of the form 91, but<br>
there are no fixed points.<br>
(d this element has 3333 = 1680 fixed points. (b)<br>
D18 has 2 elements of the form 33, and each<br>
element has  $\frac{3!}{1!1!1!} = 6$  fixed points.<br>
(c) D18 has 6 elements of the form 91, but<br>
there are no fixed points.<br>
(d) D18 ha D18 has 2 elements of the form 33, and each<br>element has  $\frac{3!}{1!1!1!} = 6$  fixed points.<br>(c) D18 has 6 elements of the form 91, but<br>there are no fixed points.<br>(d) D18 has 9 elements of the form 1124, but<br>there are no fixe element has  $\frac{1}{11111} = 6$  fixed points.<br>
(c) D18 has 6 elements of the form 91, but<br>
there are no fixed points.<br>
(d) D18 has 9 elements of the form 1124, but<br>
there are no fixed points. Thus, there are<br>  $\frac{1}{18} \times (1 \times$ (c) D18 has 6 elements of the form 91, but<br>there are no fixed points.<br>(d) D18 has 9 elements of the form 1124, but<br>there are no fixed points. Thus, there are<br> $\frac{1}{18} \times (1 \times 1680 + 2 \times 6) = 94$ <br>equivalence classes. In other there are no fixed points.<br>
(d) D18 has 9 elements of the form 1124, but<br>
there are no fixed points. Thus, there are<br>  $\frac{1}{18} \times (1 \times 1680 + 2 \times 6) = 94$ <br>
equivalence classes. In other words, there are<br>
94 different kinds o J D18 has 9 elements of the form 1124, but<br>ere are no fixed points. Thus, there are<br> $\frac{1}{2} \times (1 \times 1680 + 2 \times 6) = 94$ <br>quivalence classes. In other words, there are<br> $\frac{1}{4}$  different kinds of bracelets which can bade<br>from and  $\frac{9}{2}$  elements of the form 1124, but<br>no fixed points. Thus, there are<br>1680 + 2 × 6) = 94<br>ce classes. In other words, there are<br>ent kinds of bracelets which can be<br>n<br>hs, 3 yellow beads, and 3 green beads.<br>d beads, The set in the number of equivalence classes. In other words, there are<br>  $\frac{1}{18} \times (1 \times 1680 + 2 \times 6) = 94$ <br>
equivalence classes. In other words, there are<br>
94 different kinds of bracelets which can be<br>
made from<br>
3 red be  $18 \times (1 \times 1680 + 2 \times 6) = 94$ <br>equivalence classes. In other words, there a<br>94 different kinds of bracelets which can<br>made from<br>3 red beads, 3 yellow beads, and 3 green bead<br>4. How many bead sequences can be ma<br>from 3 red be  $\times$  1680 + 2 × 6) = 94<br>ence classes. In other words, there are<br>erent kinds of bracelets which can be<br>om<br>cads, 3 yellow beads, and 3 green beads.<br>r many bead sequences can be made<br>red beads, 3 yellow beads, and 3 green<br>an

C 4  $\times$  C 5 acting on Z3 ,3 ,3 . We need to ′′ $4 \times C5$  acts

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**International Conference on Social Development**<br>
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on Z3, 3, 3. We consider the following 6 cases:<br>
(a) C4 × C5 has an element of the form 19,<br>
and this element has  $\frac{9!}{3!3!3!} = 16$ **International Conference on Social Deveront Intelligent Technology (SDIT2024)**<br>on Z3,3,3. We consider the following 6 c<br>(a) C4 × C5 has an element of the form<br>and this element has  $\frac{9!}{3!3!3!}$  = 1680 fixed poir<br>(b) C4 **national Conference on Social Developme**<br> **ntelligent Technology (SDIT2024)**<br>
<sup>3</sup>, 3, 3. We consider the following 6 cases:<br>  $4 \times C5$  has an element of the form 19,<br>
is element has  $\frac{9!}{3!3!3!} = 1680$  fixed points.<br>  $4 \$ **International Conference on Social Dev**<br> **and Intelligent Technology (SDIT2024)**<br>
on Z3,3,3. We consider the following 6 c<br>
(a) C4 × C5 has an element of the form<br>
and this element has  $\frac{9!}{3!3!3!} = 1680$  fixed poi<br>
(b **national Conference on Social Developm**<br> **Intelligent Technology (SDIT2024)**<br>
3,3,3. We consider the following 6 cases:<br>
4 × C5 has an element of the form 19,<br>
his element has  $\frac{9!}{3!3!3!} = 1680$  fixed points.<br>
4 × C5

International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
on Z3,3,3. We consider the following 6 cases:<br>
(a) C4 × C5 has an element of the form 19,<br>
and this element has  $\frac{9!}{3!3!3!} = 1680$  **International Conference on Social Devand Intelligent Technology (SDIT2024)**<br>on Z3, 3, 3. We consider the following 6 or<br>(a) C4 × C5 has an element of the form<br>and this element has  $\frac{9!}{3!3!3!} = 1680$  fixed poid<br>(b) C4 ′′mational Conference on Social Developm<br>Intelligent Technology (SDIT2024)<br>3,3,3. We consider the following 6 cases:<br>4 × C5 has an element of the form 19,<br>his element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points.<br>4 × C5 has 2 el International Conference on Social Development<br>
and Intelligent Technology (SDIT2024)<br>
on Z3, 3, 3. We consider the following 6 cases:<br>
(a) C4 × C5 has an element of the form 19,<br>
and this element has  $\frac{9!}{3!3!3!} = 1680$ fixed and Intelligent Technology (SDIT2024)<br>on Z3, 3, 3. We consider the following 6 c<br>(a) C4 × C5 has an element of the form<br>and this element has  $\frac{9!}{3!3!3!} = 1680$  fixed poi<br>(b) C4 × C5 has 2 elements of the form 1:<br>but th Intelligent Technology (SDIT2024)<br>
3, 3, 3. We consider the following 6 cases:<br>
4 × C5 has an element of the form 19,<br>
his element has  $\frac{9!}{3!3!3!}$  = 1680 fixed points.<br>
4 × C5 has 2 elements of the form 1541,<br>
4 × C5 on Z3, 3, 3. We consider the following 6 cases:<br>
(a) C4 × C5 has an element of the form 19,<br>
and this element has  $\frac{9!}{33!3!} = 1680$  fixed points. 90 different kin<br>
(b) C4 × C5 has 2 elements of the form 1541, and effor and this element has  $\frac{9!}{3!3!3!} = 1680$  fixed points.<br>
(b) C4 × C5 has 2 elements of the form 1541,<br>
but there are no fixed points.<br>
(c) C4 × C5 has an element of the form 1522,<br>
and each element has  $\frac{5!}{3!1!1!} \times \frac$ as  $\frac{9!}{3!3!3!} = 1680$  fixed points. 90 di<br>
2 elements of the form 1541,<br>
and points. and the form 1522,<br>
has  $\frac{5!}{3!1!1!} \times \frac{2!}{0!1!1!} \times 3 = 120$ <br>
<br>
4 × C5 has 8 elements of the N<br>
elements of the form 1451, [2] I<br> and this element has 3535 – 1080 lixed points.<br>
(b) C4 × C5 has 2 elements of the form 1541, and efform 3 red<br>
(c) C4 × C5 has an element of the form 1522,<br>
and each element has  $\frac{5!}{3!111} \times \frac{2!}{01111} \times 3 = 120$ <br>
fixe (b) C4 × C5 has 2 elements of the form 1541,<br>but there are no fixed points.<br>(c) C4 × C5 has an element of the form 1522,<br>and each element has  $\frac{5!}{3!1!1!} \times \frac{2!}{0!1!1!} \times 3 = 120$ <br>fixed<br>points.<br>(d) C4 × C5 has 4 element

points.

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\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 90
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al Conference on Social Development<br>
ent Technology (SDIT2024)<br>
<sup>91</sup>/<sub>20</sub> km ent the following 6 cases:<br>
5 has an element of the form 19,<br>
ment has  $\frac{9!}{3!3!3!} = 1680$  fixed points.<br>
<sup>90</sup>/<sub>20</sub> km equivalence classes. In **International Conference on Social Development**<br>
and **Intelligent Technology (SDIT2024)**<br>
on Z3,3,3. We consider the following 6 cases:<br>
(a) C4 × C5 has an element of the form 19,<br>
and this element has  $\frac{9!}{3!3!3!} = 16$ **nal Conference on Social Development**<br> **gent Technology (SDIT2024)**<br>
We consider the following 6 cases:<br>  $\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 9$ <br>
equivalence classes. In other<br>
ment has  $\frac{90}{3!3!3!} = 1680$  fixed points.<br>
5 **nal Conference on Social Development**<br> **gent Technology (SDIT2024)**<br>
We consider the following 6 cases:<br>  $\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 9$ <br>
equivalence classes. In other<br>
ment has  $\frac{9!}{3!3!3!} = 1680$  fixed points.<br>
5 **EXERCUASE 1991**<br>
The consider the following 6 cases:<br>  $\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 9$ <br>
equivalence classes. In other<br>
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5 has 2 elements of the form 1541,<br>
e no fixed points wing 6 cases:<br>  $\frac{1}{20} \times (1 \times 1680 + 1 \times$ <br>
equivalence classes.<br>  $\therefore$  form 1541,<br>  $\therefore$  form 1541,<br>  $\therefore$  90 different kinds of<br>
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sectively.<br>  $\frac{1}{1} \times 3 = 120$ <br> **References**<br>  $\$ 6 cases:  $\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 9$ <br>
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= 120 (a)  $C4 \times C5$  has an element of the form 19,<br>
and this element has  $\frac{99}{3030}$  = 1680 fixed points.<br>
(b)  $C4 \times C5$  has 2 elements of the form 1541,<br>
but there are no fixed points.<br>
(c)  $C4 \times C5$  has an element has  $\frac{5!}{3$  $\frac{1}{3!} = 1680$  fixed points. 90 different kinds of necktions and the first sof the form 1541, and the first 4 beads are each considered in the first 4 beads are each considered in the first 4 beads are each considered i **Examplement Education**<br>  $\frac{1}{20} \times (1 \times 1680 + 1 \times 120) = 90$ <br>
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