Permutations with Identical Objects.notebook

Pre-Calculus 12 Permutations with Identical Objects

The number of permutations of n objects with r identical objects is:

 $\overline{r!}$

Ex. 1) Determine the number of permutations of the word BOOK.

switching 0's

switching 0's

doesn't change
the word

os that won't change the arrangement
if they switch positions

BOOK

Given a set of n objects with:

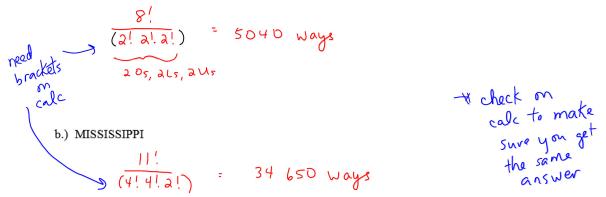
- n₁ of one kind
- n₂ of a second kind
- n₃ of a third kind etc

The number of distinguishable permutations is:

$$\frac{n!}{n_1! \cdot n_2! \dots n_k!}$$
 , where $n_1 + n_2 + n_3 + n_k = n$

Ex. 2) Determine the number of permutations of the word

a.) HONOLULU



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Ex. 3) Seven boxes of cereal on a shelf are 5 Shreddies, 1 Fruit Loops and 1 box of Captain Crunch. How many ways can the boxes be arranged?

Ex. 4) A kabob recipe calls for 3 mushrooms, 4 shrimp, 2 cherry tomatoes and 5 slices of red pepper. How many ways can you arrange the items on a skewer?

need
$$(3!.4!2!.5!)$$
 = 2 522 520 Ways brackets

Restrictions

Ex. 5) How many whole numbers are less than 300 (no repetition)?

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Ex. 6) Using all of the letters of the word PARALLELOGRAM,

a) how many arrangements can be made using all of the letters?

$$\frac{13!}{(3!2!3!)} = 86 486 400$$

b) how many of these arrangements have all the L's together?

group of these arrangements have all the L's together?

$$2R_{5}$$
, $3A_{5}$

how many of these arrangements have all of the A's together?

c) how many of these arrangements have all of the A's together?

d) how many of these arrangements have all the R's together?

e) how many of these arrangements have all the L's, all the A's, and all the R's together?

worksheet # 1-4,7,9

Assignment: Pg. 712; #3a, c, 4b, d, 5a, c, 7, 8, 9, 12, MC# 1-3