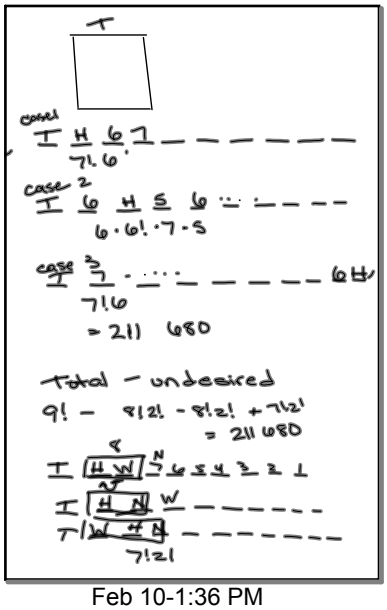


Feb 10-1:36 PM

4.3 Permutations with Identical Elements

Sometimes permutations will occur where some items are **identical**. In other words, you cannot tell them apart.

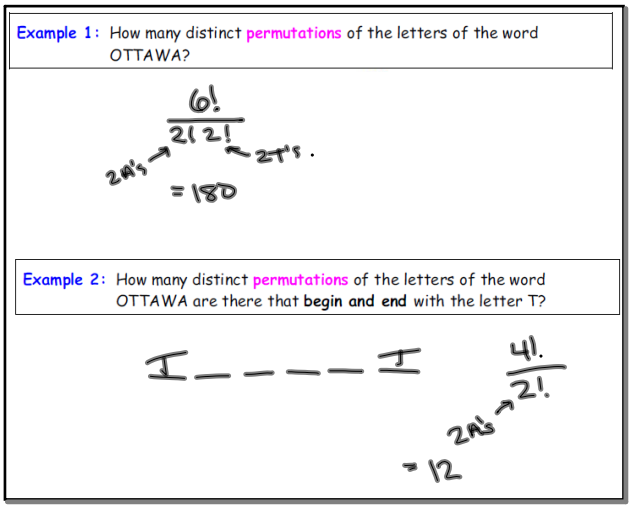
The number of permutations of a set of ***n*** objects containing:

- ***a*** identical objects of one kind;
- ***b*** identical objects of another kind;
- ***c*** identical objects of a third kind.

$$\frac{n!}{a!\,b!\,c!}$$

and so on, if there are more identical objects.

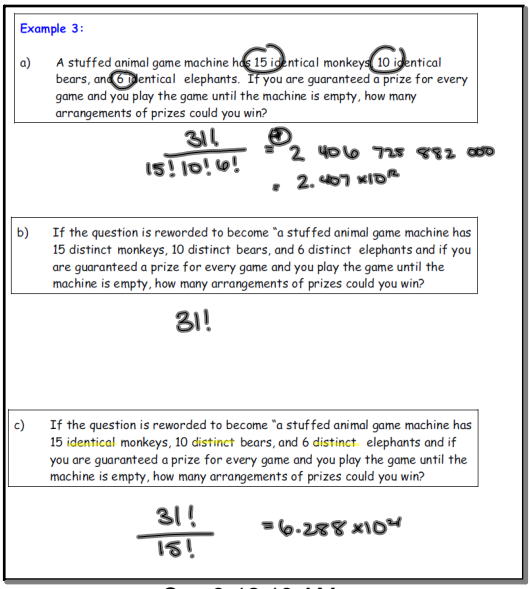
Sep 3-12:18 AM



Example 1: How many distinct permutations of the letters of the word OTTAWA?

Example 2: How many distinct permutations of the letters of the word OTTAWA are there that **begin and end** with the letter T?

Sep 11-6:40 AM



Example 3:

a) A stuffed animal game machine has 15 identical monkeys, 10 identical bears, and 6 identical elephants. If you are guaranteed a prize for every game and you play the game until the machine is empty, how many arrangements of prizes could you win?

b) If the question is reworded to become "a stuffed animal game machine has 15 distinct monkeys, 10 distinct bears, and 6 distinct elephants and if you are guaranteed a prize for every game and you play the game until the machine is empty, how many arrangements of prizes could you win?

c) If the question is reworded to become "a stuffed animal game machine has 15 identical monkeys, 10 distinct bears, and 6 distinct elephants and if you are guaranteed a prize for every game and you play the game until the machine is empty, how many arrangements of prizes could you win?

Sep 3-12:19 AM

Ex:

(a) How many distinct seven digit numbers can be constructed from the digits **1, 2, 2, 3, 3, 4, 5 ?**

(b) How many of these would be *odd numbers*?

(c) How many of these would be less than 3,000,000?

Sep 2-11:12 PM