Name _____ Date _____

Permutations and Combinations - Guided Lesson Explanation

Explanation#1

The number of permutations of n objects taken r at a time is.

$P(n,r) = \frac{n!}{(n-r)!}$

Step 3) $P(n,r) = \frac{6!}{(6-2)!}$

$P = \frac{6!}{4!}$

$P = 30$

There are 30 ways to arrange 6 items taken 2 at a time when order matters.

Explanation#2

The number of combinations of a group of n objects taken r at a time is:

$C(n,r) = \frac{n!}{r!(n-r)!}$

Step 3) Since order does not matter, use the combination formula.

$C(7,3) = \frac{7!}{3!(7-3)!} = \frac{7!}{3!(4)!}$

$C = \frac{7x6x5}{3x2x1} = \frac{210}{6} = 35$

There are 35 ways to arrange 7 items taken 3 at a time when order does not matter.

Name _____ Date _____

Explanation # 3

The number of permutations of n objects taken r at a time is.

$P(n,r) = \frac{n!}{(n-r)!}$

Step 3) $P(n,r) = \frac{10!}{(10-9)!}$

$P = \frac{10!}{1!}$

P = 3628800

There are 3628800 ways to arrange 10 items taken 1 at a time when order matters.