Name _____

Permutations with Distinct Objects

Date _____ Period _____

Permutation

an arrangement of *r* objects out of *n* total distinct objects.

Two situations....

Distinct objects can be repeated Distinct objects can not be repeated

Permutation

an arrangement of *r* objects out of *n* total distinct objects.

Two situations....

Distinct objects can be repeated Distinct objects can not be repeated

How many two digit codes can be created if both symbols are lowercase letters and can be repeated?

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated Distinct objects can not be repeated

A standard combination lock has 40 distinct tic marks (0-39), each representing a numerical value. If a lock's combination consists of three distinct numerical values and allows for repetition, how many different combinations can be created?

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated Distinct objects can not be repeated

arrangements = n^r

$$\underset{26 \text{ options}}{\underbrace{a\text{-}z}} \times \underset{26 \text{ options}}{\underbrace{a\text{-}z}}$$

$$\underset{40 \text{ options}}{\underbrace{0\text{-}39}} \times \underset{40 \text{ options}}{\underbrace{0\text{-}39}} \times \underset{40 \text{ options}}{\underbrace{0\text{-}39}}$$

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated

arrangements = n^r

Distinct objects can not be repeated

How many three digit codes can be created if all three symbols are lowercase letters and <u>can not</u> be repeated?

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated

arrangements = n^r

Distinct objects can not be repeated

The number of arrangements of n objects using r of those objects where

1. The n objects are distinct/different objects,
2. Objects can not be replaced or used more than once,
3. The order of the objects is important,

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

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated

arrangements = n^r

Distinct objects can not be repeated

How many different ways can you arrange three of the letters in T E X A S ?

Permutation

an arrangement of r objects out of n total distinct objects.

Two situations....

Distinct objects can be repeated

arrangements = n^r

Distinct objects can not be repeated

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