# Introduction to Probability

## Calculations using the Choose Operator

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# Choose Operator

For the positive integer *n* and non-negative integer *k* ( with $k \leq n$), the choose operater is calculated as follows:

$$\binom{n}{k} = \frac{n!}{k! \times (n-k)!}$$

Evaluate the following:

1 $\binom{5}{2}$

2 $\binom{5}{0}$

3 $\binom{10}{1}$

4 $\binom{10}{9}$

# Counting Sets with Venn Diagrams

- The Venn Diagram shows the number of elements in each subset of set $S$.

- If $P(A) = 3/10$ and $P(B) = 1/2$, find the values of $x$ and $y$

# Counting Sets with Venn Diagrams

- The total number of items in the data set is $x + y + 5$
- There are $x + 1$ items in Area $A$
- There are $x + y$ items in Area $B$
- We can say

$$P(A) = \frac{3}{10} = \frac{x + 1}{x + y + 5}$$

$$P(B) = \frac{1}{2} = \frac{x + y}{x + y + 5}$$

**Cross Multiplication**

$$P(A) = \frac{3}{10} = \frac{x+1}{x+y+5}$$

**Cross Multiplication**

$$P(B) = \frac{1}{2} = \frac{x + y}{x + y + 5}$$

**Simultaneous Equations**

1) $7x - 3y = 5$

2) $x + y = 5$

**Simultaneous Equations**

- $7x - 3y = 5$
- $x + y = 5$