

Review: Key Vocabulary & Formulas

Sample Space:

The set of all possible outcomes in an experiment

Notation: $\{ \}$

Example: List the sample space for the following situations

- Rolling a 6-sided die: $\{1, 2, 3, 4, 5, 6\}$
- Choosing a boy or a girl from this school (grades): $\{9^{th}, 10^{th}, 11^{th}, 12^{th}\}$
- Drawing a skittle from a full bag: $\{red, green, yellow, purple, orange, pink\}$

Intersection of two sets ($A \cap B$):

The set of all elements in BOTH

A and B



Union of two sets ($A \cup B$):

The set of all elements in EITHER

A or B

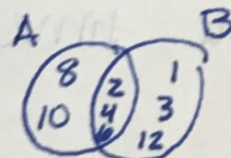


$A \cup B$

Example: Given the following sets, find $A \cap B$ and $A \cup B$.

$A = \{2, 4, 6, 8, 10\}$

$B = \{1, 2, 3, 4, 6, 12\}$



$A \cap B = \{2, 4, 6\}$

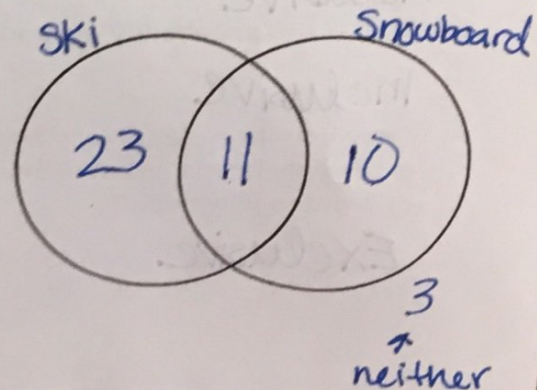
$A \cup B = \{1, 2, 3, 4, 6, 8, 10, 12\}$

Venn Diagram:

A visual representation of sets and their relationship to each other

Example: There are 47 students on a bus en route to a ski resort. Of these students, 44 plan to either ski or snowboard. 23 of the students will ski, but not snowboard. 11 students will both ski and snowboard. How many students on the bus will snowboard, but not ski?

$23 + 11 = 34$
 $44 - 34 = 10$



Probability of an Event $P(E) = \frac{\text{desired outcome}}{\text{total possibilities}}$

$P(\text{odd})$

Examples:

1. What is the probability that a dice lands on a 5?

$$\frac{1}{6}$$

2. Given: 3 red marbles, 2 green marbles and 7 blue marbles, what is the probability of
① choosing a green marble? ② of a red or blue marble?

$$\textcircled{1} \frac{2}{12} \rightarrow \frac{1}{6}$$

$$\textcircled{2} \frac{10}{12} \rightarrow \frac{5}{6}$$

3. In a regular deck of cards,

a. $P(10)$

$$\frac{4}{52} \rightarrow \frac{1}{13}$$

b. $P(Q \text{ of Hearts})$

$$\frac{1}{52}$$

c. $P(\text{Face Card})$

$$\frac{12}{52} \rightarrow \frac{3}{13}$$

Mutually Exclusive Events:

Two events that do not depend on each other.
They can't happen at the same time

Formula: $P(A \text{ or } B) = P(A) + P(B)$

Mutually Inclusive Events:

Two events that could happen at the same time

Formula: $P(M \text{ and } N) = P(M) + P(N) - P(M \cap N)$

Examples: First, identify if the events are exclusive or inclusive. Then, solve.

1. 2 dice are tossed. What is the probability of obtaining a sum less than 5 or equal to 8?

Exclusive

2. A card is chosen at from a standard deck of cards. What is the probability that the card chosen is a heart of a face card?

Inclusive

3. What is the probability of randomly choosing a boy and a sophomore in this class?

Inclusive

4. Jerry bought a bag of jelly beans that contained 10 red jelly beans, 15 blue jelly beans and 12 green jelly beans. What is the probability of Jerry reaching into the bag and pulling out a red or a green jelly bean?

Exclusive