

11-3 Probability of Multiple Events

Objective:

- To find the probability of the event *A and B*
- To find the probability of the event *A or B*

Common Core Content Standard:

S.CP.7 Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ and interpret the answer in terms of the model.

Also **S.CP.2**, **S.CP.5**

When the occurrence of one event affects how a second event can occur, the events are _____ events. Otherwise, the events are _____ events.

Example 1: Classifying Events

each pair of events dependent or independent?

a.) Flip a coin. Then roll a number cube.

b.) Choose a marble from a bag. Keep the marble, and then choose another marble from the same bag.



Key Concept Probability of A and B

If *A* and *B* are independent events, then $P(A \text{ and } B) = P(A) \cdot P(B)$.

Example 2: Finding the Probability of Independent Events

What is the probability of rolling a 6 on a fair number cube and flipping a coin and getting tails?

Two events that cannot happen at the same time are _____ events. If A and B are mutually exclusive events, then $P(A \text{ and } B) = 0$.

Example 3: Mutually Exclusive Events

You select one card from a standard 52-card deck. Are the events mutually exclusive? Explain.

a.) Choosing a red card or an even numbered card.

b.) Choosing a red card or a black card.

Take note

Key Concept Probability of A or B

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

If A and B are mutually exclusive events, then $P(A \text{ or } B) = P(A) + P(B)$.

Example 4: Finding Probability for Mutually Exclusive Events

Students choose one elective each school year. About 18% chose woodworking and about 38% chose music. What is the probability that a student chosen at random has selected woodworking or music as an elective?

When two events are not mutually exclusive, you need to _____ the probability of the common outcomes to find $P(A \text{ or } B)$.

Example 5: Finding Probability

Multiple Choice. The numbers 1 through 10 are written on index cards and placed in a box. What is the probability that a card chosen at random has a number that is greater than 7 or even?

- a.) 30%
- b.) 50%
- c.) 60%
- d.) 80%