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NOTES: Section 10.5 – Find Probabilities of Independent and Dependent Events

Goals: #1 - I can find the probability of independent and dependent events.

Homework: Lesson 10.5 Worksheet



Warm Up:

1. A card is randomly selected from a standard deck of 52 cards. What is the probability that it is a queen or an ace?

2. Of 200 students at school, 58 play football, 40 play basketball, and 93 play both. What is the probability that a randomly selected student plays either football or basketball but NOT both?

Notes:

Two events are _____ if the occurrence of one has no effect on the occurrence of the other.

Example:

- If A and B are independent events, then the probability that both A and B occur is:

Example #1:

Events A and B are independent. Find the probability.

1. $P(A) = 0.3$
   $P(B) = 0.4$
   $P(A \text{ and } B) = ?$

2. $P(A) = \frac{3}{4}$
   $P(B) = ?$
   $P(A \text{ and } B) = \frac{3}{5}$

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Example #2:

For a fundraiser, a class sells 150 raffle tickets for a mall gift certificate and 200 raffle tickets for a booklet of movie passes. You buy 5 raffle tickets for each prize. What is the probability that you win both prizes?

You practice:

During a high school track meet, each race consists of 9 competitors who are randomly assigned lanes from 1 to 9. What is the probability that a runner will draw lanes 1, 2, or 3 in the three races in which he competes?

Example #3:

A manufacturer has found that 2 out of every 500 coffee pots produced are defective. What is the probability that at least one coffee pot is defective in the first 300 coffee pots made?

Notes:

Two events are _____ if the occurrence of one affects the occurrence of the other.

Example:

- If A and B are dependent events, then the probability that both A and B occur is:

The probability that B will occur, given that A has occurred is called the _____:

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Example #4:

Events A and B are dependent. Find the probability.

1. $P(A) = 0.6$
   $P(B|A) = ?$
   $P(A \text{ and } B) = 0.45$

2. $P(A) = \frac{7}{10}$
   $P(B|A) = \frac{1}{2}$
   $P(A \text{ and } B) = ?$

Example #5:

You randomly select two marbles from a bag containing 15 yellow, 10 red, and 12 blue marbles. What is the probability that the first marble is yellow and the second marble is not yellow if:

1. You replace the first marble before selecting the second.

2. You do *not* replace the first marble.

You practice:

You randomly select two cards from a standard deck of 52 cards. What is the probability that the first card is a spade and the second card is a club if:

1. You replace the first card before selecting the second.

2. You do *not* replace the first card.

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Example #6:

Your teacher passes around a box with 10 red pencils, 8 pink pencils, and 13 green pencils. If you and the two people in your group are the first to randomly select a pencil, what is that probability that all three of you select pink pencils?

Fun example to end the unit:

What is the probability that at least 2 people in our class have the same birthday?