Section 11-2/11-3
Probability/
Probability of Multiple Events

Students will be able to:
-find the probability of an event using theoretical and experimental probability
-find the probability of event A or B
-find the probability of event A and B

Aug 18-2:52 PM

Probability measures how likely it is for an event to occur.

We will look at two different types of probability:
-experimental (based on an experiment)
-theoretical (what it should be based on data)

Aug 18-2:52 PM

Experimental Probability:

$P(\text{event}) = \frac{\text{number of times the event occurs}}{\text{number of trials}}$

$\frac{47}{100}$

What does 0% probability mean? 100%?

Aug 18-2:52 PM

A softball player got a hit in 20 of her 50 at bats. What is the experimental probability that she will get a hit in her next at bat?

$\frac{20}{50}$ 40%

What is the theoretical probability?

Aug 18-2:52 PM

Theoretical Probability:
how many times is it possible to happen

Getting tails on a fair coin? 50%

Getting an even number on a die? $\frac{3}{6} = 50\%$

2 on a dice $\frac{1}{6}$

Aug 18-2:52 PM

What is the theoretical probability of getting a sum that is an odd number on one roll of two standard number cubes?

30%

Aug 18-2:52 PM

You can find the probabilities of multiple events occurring by using the probabilities of the individual events.

-when the occurrence of one event affects how a second event can occur, they are dependent. Otherwise they are independent.

Aug 18-2:52 PM

Independent or Dependent?

You select a coin at random from your pocket, put it back, and select again.

independent

You roll a number cube and flip a coin.

independent

Aug 18-2:52 PM

Probability of Independent Events:

$P(A \text{ and } B) = P(A) \cdot P(B)$

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

$\frac{1}{6} \cdot \frac{1}{2} = \frac{1}{12} = .083$

8.3%

Aug 18-2:52 PM

When two events are mutually exclusive, they cannot happen at the same time.

$P(A \text{ and } B) = 0$

-Example: flipping a heads and a tails on the same coin at the same flip.

Aug 18-2:52 PM

To find P(A or B), you have to determine if A and B are mutually exclusive:

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

if they are mutually exclusive:

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

Aug 18-2:52 PM

Students choose one elective every 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?

18% + 38% = 56%

Aug 18-2:52 PM

If two events are not mutually exclusive:

P(A or B) = P(A) + P(B) - P(A and B)

The numbers 1 - 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?

$\frac{3}{10} + \frac{5}{10} = \frac{8}{10} - \frac{2}{10} = \frac{6}{10}$ 60%

Aug 18-2:52 PM

Hwk:

pg. 685 - 686 #8, 14 - 22 evens, 30, 34

pg. 691-692 #10 - 30 evens, 33 - 36 all, 42

Apr 30-10:24 AM