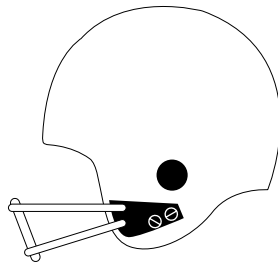
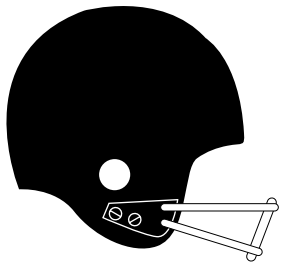
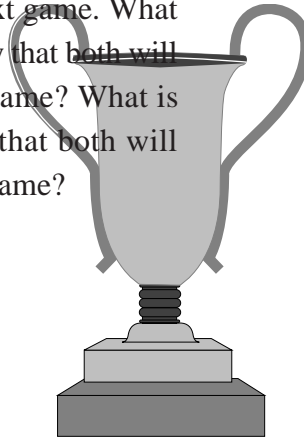


Winning Probabilities

Independent Events and Mutually Exclusive Events

Jena likes to keep up with the statistics of her favorite sports teams. She also likes to determine the probabilities of certain teams winning or losing given different situations. Jena likes to write all the probabilities she finds both as decimals and as fractions. Can you help her find the probabilities in the situations given below, written both as decimals and as fractions?

The estimated probability that the Bulldogs will win their next game is 0.66. The estimated probability that the Wolverines will win their next game is 0.79. They do not play each other for the next game. What is the probability that both will win their next game? What is the probability that both will lose their next game?



The estimated probability that the Cougars will win their next game by 1 point is 0.369. The probability that they will win their next game by 5 points is 0.457. What is the probability that they will win their next game by either 1 or 5 points? If the probability that they will lose their next game is 0.124, what is the probability that they will win the next game by a margin other than 1 or 5 points?

Thinking Cap



If the Cougars and the Wolverines do not play each other, what is the probability that either team will win the next game? What is the probability if they do play each other?

Winning Probabilities

Independent Events and Mutually Exclusive Events

Topic: Finding Probabilities of Independent Events and Mutually Exclusive Events

Objective: To use the calculator to find probabilities of independent events and mutually exclusive events.

NCTM Standards: Problem Solving, Probability

Using the Activity

Students use the calculator in this activity to multiply and add probabilities to find the probabilities of independent events and mutually exclusive events.

- The **F-D** key can be used to change decimals to fractions and fractions to decimals.

Example Since the Bulldogs and the Wolverines do not play each other in their next games, the probabilities of both of them winning their next games are independent events. So, the probabilities of each team winning their next games should be multiplied.

$$0.66 \times 0.79 = 0.5214000 \text{ F-D } \frac{2607}{5000}.$$

Assessment Encourage students to check their probabilities to be sure they make sense given the situation in the problem.

Answers

See example for answer to the first question in the first problem.

The probability that both the Bulldogs and the Wolverines will lose their next game is

$$(1 - 0.66) \times (1 - 0.79) = 0.0714000 \text{ F-D } \frac{357}{5000}.$$

The probability that the Cougars will win their next game by 1 or 5 points is

$$0.369 + 0.457 = 0.8260000 \text{ F-D } \frac{413}{500}.$$

The probability that the Cougars will win their next game by a margin other than 1 or 5 points is

$$1 - (0.826 + 0.124) = 0.0500000 \text{ F-D } \frac{1}{20}.$$

Thinking Cap Answers

$$0.66 + 0.79 - 0.5214 = 0.9286000 \text{ F-D } \frac{4643}{5000}; 1$$