

Experimental Probability -

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

Theoretical Probability

$$P(A) = \frac{m}{n}$$

n = equally likely
outcomes

m = outcomes

Examples

1) A class tossed coins and recorded 161 heads and 179 tails. What is the experimental probability of heads? tails?

$$P(\text{heads}) = \frac{161}{340} = 47.4\%$$

~~340~~

$$P(\text{tails}) = \frac{179}{340} = 52.6\%$$

2) Another class rolled number cubes. They rolled the cube 268, and rolled a four, 44 times. What is the experimental probability that the class rolled a 4.

$$P(4) = \frac{1}{6} = .167 = 16.7\%$$

$$P(4) = \frac{44}{268} = 16.4\%$$

A group of 10 cards are numbered 1-10. You choose one card at random. Find each theoretical probability.

3) P(card is a 3).

$$\frac{1}{10} = 10\%$$

4) P(even number)

$$\frac{5}{10} = \frac{1}{2} = 50\%$$

5) P(prime number)

$$\frac{4}{10} = \frac{2}{5} = 40\%$$

6) P(less than 7)

$$\frac{6}{10} = \frac{3}{5} = 60\%$$

A jar contains 30 red marbles, 50 blue marbles, and 20 white marbles. You pick one marble at random from the jar. Find each theoretical probability.

7) P(red) $\frac{30}{100} = \frac{3}{10} = 30\%$

8) P(blue) $\frac{50}{100} = \frac{1}{2} = 50\%$

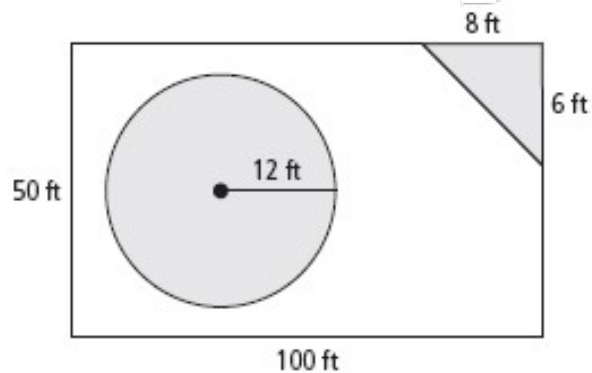
9) P(not white) $\frac{80}{100} = \frac{8}{10} = \frac{4}{5} = 80\%$

10) P(white or blue)
 $\frac{70}{100} = \frac{7}{10} = 70\%$

The rectangular yard shown below has a circular pool and a triangular garden. A ball from an adjacent golf course lands at a random point within the yard. Find each theoretical probability.

The ball lands in the pool.

$$P(\text{pool}) = \frac{452.39}{5000} \\ = .090 = 9\%$$



$$\begin{aligned} \text{Area of Yard} &= 5000 \text{ ft}^2 \\ \text{Area of Pool} &= 452.39 \text{ ft}^2 \\ \text{Area of Garden} &= 24 \text{ ft}^2 \\ \text{Area not used} &= 4523.61 \text{ ft}^2 \end{aligned}$$

