

2-6 Theoretical and Experimental Probability



Please read Pages 93-95 and complete the Quick Checks 1-5.

Today's Vocabulary:

- ☺ **Probability** ☺ **Outcome** ☺ **Event**
- ☺ **Sample Space** ☺ **Theoretical Probability**
- ☺ **Complement of an event** ☺ **Odds**
- ☺ **Experimental Probability**

Finding Theoretical Probability:

A bowl contains 12 slips of paper, each with a different name of the month. Find the theoretical probability that a slip selected at random from the bowl has the name of a month that ends with

"ber". $\frac{4}{12} = \frac{1}{3}$

Finding the Complement of an Event:

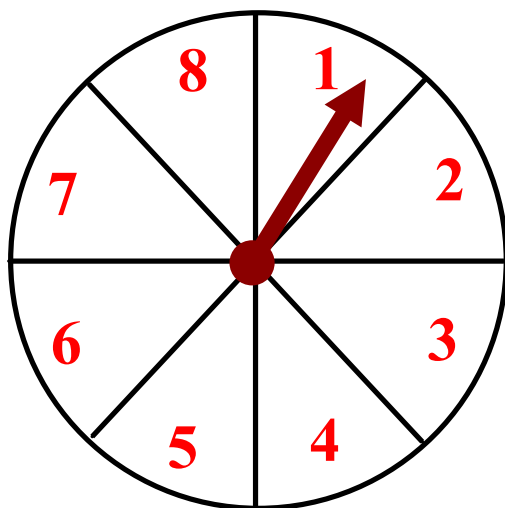
For a number cube, find the probability of not rolling a number divisible by 3.

$$P(\text{not div. by } 3)$$

$$\frac{4}{6} = \frac{2}{3}$$

Finding Odds:

Find the odds in favor of the spinner landing on an even number.



$$\text{odds in favor} = \frac{\text{favor}}{\text{unfavor}}$$
$$4:4$$
$$1:1$$

Finding Experimental Probability:

Quality control inspected 500 belts at random. They found no defects in 485 belts. What is the probability

$$\frac{485}{500}$$

that a belt selected at random will pass quality control? If the belt

$$.97$$

$$(97\%)$$

manufacturer has 6258 belts, how many belts are likely to have no defects?

$$\frac{485}{500} = \frac{n}{6250}$$

$$(6070)$$

2-7 Probability of Compound Events



Please read Pages 101-103 and complete the Quick Checks 1-4.

Today's Vocabulary:

☺ **Independent Events**

☺ **Dependent Events**

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

**Suppose you roll two number cubes.
What is the probability that you
will roll an odd number on one cube
and a multiple of three on the other
cube.**

$$\frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6} \quad \left(\frac{3}{6}\right)\left(\frac{2}{6}\right)$$

Selecting with Replacement:

Suppose you have 3 quarters and 5 dimes in your pocket. You take out one coin, and then put it back. Then you take out another coin. What is the probability that you take out a dime and then a quarter?

$$\left(\frac{5}{8}\right)\left(\frac{3}{8}\right) = \frac{15}{64}$$

Dependent Events: $P(A \text{ then } B) = P(A) \bullet P(B \text{ after } A)$

Suppose you have 3 quarters and 5 dimes in your pocket. Without replacing the coin, you select a second coin. What is the probability that you take out a dime and then a quarter?

$$\left(\frac{3}{8}\right) \left(\frac{5}{7}\right) = \frac{15}{56}$$

Real-World Problem Solving:

A teacher must select 2 students for a conference. The teacher randomly picks names from among 3 freshman, 2 sophomores, 4 juniors, and 4 seniors. What is the probability that a junior and then a senior are chosen?

$$\left(\frac{4}{13}\right)\left(\frac{4}{12}\right) = \frac{4}{39}$$

Assignment:

Page 96: #'s 2-28 evens.

Page 104: #'s 1-21 odds.