Lesson 11-5

Objective – To determine the sample space, outcomes, and probability of simple events.

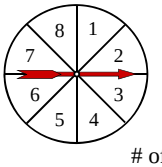
Probability is always expressed as fractions (or decimals) between 0 and 1.

Probability-future

$0 \leq P \leq 1$

impossible — certain

Probability of Single Events



Event - Spinning the spinner.

Outcome - Possible results.

Sample Space - List of all possible outcomes.

$$\text{Probability} = \frac{\text{\# of favorable outcomes}}{\text{\# of possible outcomes}}$$

Find the probability of each event.

1) P(3) = $\frac{1}{8}$

2) P(even #) = $\frac{4}{8} = \frac{1}{2}$

3) P(# < 6) = $\frac{5}{8}$

4) P(composite #) = $\frac{3}{8}$

Probability of Single Events

A letter is chosen at random from the word *ALGEBRA*

Find the probability of each event.

1) P(*G*) = $\frac{1}{7}$

2) P(*A*) = $\frac{2}{7}$

3) P(*A* or *B*) = $\frac{3}{7}$

4) P(not *E*) = $\frac{6}{7}$

Probability of Single Events

A standard deck consists of 52 playing cards. Find the probability of drawing the following.

1) P(*Ace*) = $\frac{4}{52} = \frac{1}{13}$

2) P(*Club*) = $\frac{13}{52} = \frac{1}{4}$

3) P(*Face Card*) = $\frac{12}{52} = \frac{3}{13}$ (*Jack, Queen or King*)

4) P(not *Heart*) = $\frac{39}{52} = \frac{3}{4}$

Complementary Events

Two events are complementary if their intersection is the empty set and their union is the set of all possible outcomes.

Complementary

P(Storm on weekend) + P(Storm on weekday) = 1

$\frac{2}{7} + \frac{5}{7} = 1$

The sum of probabilities for complementary events always equals 1.

P(It will rain) + P(It will not rain)

30% + 70% = 100%

Determine the sample space and the outcome for each event shown.

1)

Sample Space: {Heads, Tails}

Outcome: Heads

2)

Sample Space: {1, 2, 3, 4, 5, 6}

Outcome: 5