Name_____   Date_____

Probability

Probability refers to the likelihood of an event occurring or what the chances are that something will happen. When considering whether it is likely that it will rain tomorrow, if there is a fifty fifty chance, then we can express the probability of it raining tomorrow in terms of:

- Fractions: the likelihood of it raining is: ½

- Ratios: 50:50

- Percents: 50%

The basic rule for finding out what the probability of an event occurring is:

$$P\,(E) = \frac{\text{Number of Desired Outcomes}}{\text{Total Number of Possible Outcomes}}$$

In the above example, P stands for probability and E stands for event.

For example, if you are going to throw a dice, then to figure out what the probability of the dice landing on a 4, you would substitute the values in the formula to find out what the probability is.

$$P\,(\text{throwing a 4}) = \frac{\text{Number of Desired Outcomes}}{\text{Total Number of Possible Outcomes}} = \frac{1}{6}$$

To find the probability of throwing an odd or even number when you throw a dice, you would solve by:

$$P\,(\text{throwing a 1}) = \frac{1}{6}$$

$$P\,(\text{throwing a 2}) = \frac{1}{6}$$

$$P\,(\text{throwing a 3}) = \frac{1}{6}$$

$$P\,(\text{throwing a 4}) = \frac{1}{6}$$

$$P\,(\text{throwing a 5}) = \frac{1}{6}$$

$$P\,(\text{throwing a 6}) = \frac{1}{6}$$

Probability (Cont'd)

Probability (throwing an even number) = $\dfrac{1}{6}$ + $\dfrac{1}{6}$ + $\dfrac{1}{6}$ = $\dfrac{3}{6}$ = $\dfrac{1}{2}$

Probability (throwing an odd number) = $\dfrac{1}{6}$ + $\dfrac{1}{6}$ + $\dfrac{1}{6}$ = $\dfrac{3}{6}$ = $\dfrac{1}{2}$

If there is a jar with 6 red marbles, 10 blue marbles, and 8 green numbers. The probability of picking a blue marble = $\dfrac{10}{24}$ = $\dfrac{5}{12}$

A teacher puts all the names of the students in a hat. There are 16 boys and 14 girls. The probability of the teacher picking a name of a boy = $\dfrac{16}{30}$ = $\dfrac{8}{15}$

All probabilities are between 0 and 1. Probability being equal to 0 means that there is a zero chance that the event will occur. Probability being equal to 1 means that the event will definitely occur. Probabilities lie between 0 and 1. $0 \le P(E) \le 1$

The higher the probability the greater the chance that the event will occur.

Probability Questions

Multiple Choice:

1. Probability can be expressed in terms of:
   - a. Fractions
   - b. Ratios
   - c. Percents
   - d. All of the above

2. If it is impossible for something to happen, then the probability is equal to:
   - a. 0
   - b. 0.5
   - c. 1
   - d. 2

3. If something is definitely going to occur, the probability is equal to:
   - a. 0
   - b. 0.5
   - c. 1
   - d. 2

4. The higher the probability:
   - a. The lesser the chance an event will occur
   - b. The greater the chance an event will occur
   - c. The certainty that the event will not occur
   - d. None of the above

5. In a company, there are 22 women and 18 men. One person in the company will get a prize. What is the probability that the person receiving a prize is a man:
   - a. 18/40
   - b. 9/20
   - c. 22/40
   - d. a and b

6. If a person chooses a random number between 1 and 7, what is the probability that the person will choose an odd number:
   - a. 1/7
   - b. 3/7
   - c. 4/7
   - d. 5/7

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Probability Answers

Multiple Choice:

1. Probability can be expressed in terms of:
   a. Fractions
   b. Ratios
   c. Percents
   d. All of the above

2. If it is impossible for something to happen, then the probability is equal to:
   a. 0
   b. 0.5
   c. 1
   d. 2

3. If something is definitely going to occur, the probability is equal to:
   a. 0
   b. 0.5
   c. 1
   d. 2

4. The higher the probability:
   a. The lesser the chance an event will occur
   b. The greater the chance an event will occur
   c. The certainty that the event will not occur
   d. None of the above

5. In a company, there are 22 women and 18 men. One person in the company will get a prize. What is the probability that the person receiving a prize is a man:
   a. 18/40
   b. 9/20
   c. 22/40
   d. a and b

6. If a person chooses a random number between 1 and 7, the probability that the person will choose an odd number is:
   a. 1/7
   b. 3/7
   c. 4/7
   d. 5/7