

# **Chapter 11**

## **Probability**

**and**

## **Data**

## Probability and Odds

Assignment:

Probability of an Event **the likelihood that an event will occur. This can be written as a percent, as a decimal or as a reduced fraction (improper fraction)**

Outcomes **The number of possibilities that there can be in an event**

Event **what you are finding the probability of**

Theoretical probability **probability of an event if only done once**

Favorable outcomes **The number of outcomes that you are looking to have**

Experimental probability **probability of an event that has occurred many times.**

Odds  **$\frac{\text{like to occur}}{\text{Not occur}}$  These are ratios: a : b or a to b**

Examples

Total outcomes: 23

$$P(\text{Event}) = \frac{\text{Favorable}}{\text{Total}}$$

1. There are 5 red marbles, 10 blue marbles, and 8 green marbles in a bag. Find the probabilities of randomly choosing the following:

a. red

c. not blue

d. red or blue

e. red or green or blue

f. orange

$$P(\text{r or b}) = \frac{15}{23}, 0.652, 65.2\%$$

$$P(\text{r, g, or b}) = \frac{23}{23}, 1.000, 100.0\%$$

$$P(\text{red}) = \frac{5}{23}, 0.217, 21.7\%$$

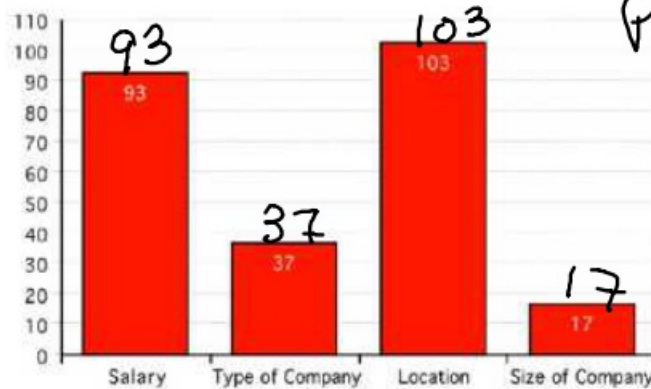
$$P(\text{Not blue}) = \frac{13}{23}, 0.565, 56.5\%$$

Total outcomes: 25

2. In a group of students, 12 ride the bus to school, 8 are driven to school, and 5 walk. One of the students is chosen at random from the group. What is the probability that the student walks to school?

$$P(\text{walk}) = \frac{5}{25} = \frac{1}{5} = .200, 20.0\%$$

3. Use the bar graph below showing the responses of 250 college students to a survey "Which factor is most likely to influence your job after graduation?" If you were to ask a randomly chosen college student this question, what is the experimental probability that the student would say "type of company"?



$$P(\text{type}) = \frac{37}{250} = 0.148 = 14.8\%$$

4. Find the odds of randomly choosing the indicated letter from a bag that contains the letters in the name of the given dog breed.

- 9 Total a. D: DACHSHUND  $\frac{2}{7} = 2:7$   
 15 Total b. R: GOLDEN RETRIEVER  $\frac{3}{12} = \frac{1}{4} = 1:4$   
 6 Total c. O: POODLE  $\frac{2}{4} = \frac{1}{2} = 1:2$

4. The probability that it will snow is 0.34. What are the odds that it will snow?

$$\frac{34\%}{66\%} = \frac{17}{33} \text{ or } 17:33$$

5. A candy dish contains 12 miniature chocolate bars and 21 hard candies. What are the odds that a candy picked at random from the dish will be a hard candy?

$$\frac{21}{12} = \frac{7}{4} \text{ or } 7:4$$

6. Last January, it snowed 7 days, was sunny 18 days, and was cloudy 6 days.

31 days.

a. Based on this information, what is the probability that it will snow on a randomly chosen day in January?

$$\frac{7}{31}, 22\%, 22.9\%$$

b. Is the above probability experimental or theoretical?

