Find the probability that the combined sample tests positive with at least 1 of the 10 people infected. Is it likely that such combined samples test positive?

15. Georgia Win for Life In the Georgia Win for Life lottery, winning the top prize of $1000 a week for life requires that you select the correct six numbers between 1 and 42 (in any order). What is the probability of winning the top prize? Express the answer as a fraction.

16. Georgia Fantasy 5 In the Georgia Fantasy 5 lottery, winning the top prize requires that you select the correct five numbers between 1 and 39 (in any order). What is the probability of winning the top prize? Express the answer as a fraction.

17. Numbers Game Before the proliferation of legal lotteries, illegal numbers games were commonly run by members of organized crime groups. In the typical numbers game, bettors would win by selecting the same three digits that were later drawn in the same order. A common payoff was $600 for a winning $1 bet. Find the probability of winning with a bet in such a numbers game.

18. Trifecta In horse racing, a trifecta is a bet that the first three finishers in a race are selected in the correct order. In a race with 12 horses, how many different trifecta bets are possible? If you randomly guess the order of the first three finishers in a race with 12 horses, what is the probability of winning?

Cumulative Review Exercises

Please be aware that some of the following problems may require knowledge of concepts presented in previous chapters.

1. Oscar Winners Listed below are the differences (in years) between the ages of actresses and actors when they won Oscars. The differences are found by subtracting the age of the male winner from the age of the female winner: (actress age) − (actor age). The differences are found using results from the last 12 years (as listed in Data Set 11 in Appendix B).

−20 −15 −3 −12 6 −15 −7 −9 16 −18 −15 −15

a. Find the mean. Compare the result to the value of the mean that would be expected if there is no gender discrepancy between the ages of Oscar-winning actresses and actors.

b. Find the median. Compare the result to the value of the median that would be expected if there is no gender discrepancy between the ages of Oscar-winning actresses and actors.

c. Find the standard deviation.

d. Find the variance. Be sure to include the units of measurement.

e. Find the value of the first quartile, Q_1.

f. Find the value of the third quartile, Q_3.

g. Construct a boxplot. What does the boxplot suggest about the distribution of the data?

2. Unusual/Unlikely Events

a. The mean pulse rate for adult women is 77.5 beats per minute, with a standard deviation of 11.6 beats per minute (based on Data Set 1 in Appendix B). Using the range rule of thumb, would a pulse rate of 100 beats per minute be considered unusual? Explain.

b. For the pulse rates of adult women described in part (a), is a pulse rate of 50 beats per minute unusual? Explain.

c. For a couple having eight children, is it unlikely to have all girls? Explain.

d. For a couple having three children, is it unlikely to have all girls? Explain.