

Chapter 8 Application Questions

Section 8.2

1. Consider a job offer with a starting salary of \$48,500 and an annual raise of \$2500. Determine the total compensation from the company through six full years of employment.
2. A brick patio has the approximate shape of a trapezoid. The patio has 18 rows of bricks. The first row has 14 bricks and the 18th row has 31 bricks. How many bricks are in the patio?
3. An auditorium has 20 rows of seats. There are 20 seats in the first row, 21 seats in the second row, 22 seats in the third row, and so on. How many seats are there in all 20 rows?
4. A hardware store makes a profit of \$30,000 during its first year. The store owner sets a goal of increasing profits by \$5000 each year for 4 years. Assuming that this goal is met, find the total profit during the first 5 years of business.

Section 8.3

1. A deposit of \$100 is made on the first day of each month in a savings account that pays 6% compounded monthly. Find the balance of this annuity after 4 years.
2. The temperature of water in an ice cube tray is 70°F when it is placed in a freezer. Its temperature n hours after being placed in the freezer is 20% less than one hour earlier.
 - a) Find the formula for the n th term of the geometric sequence that gives the temperature of the water n hours after it is placed in the freezer.
 - b) Find the temperature of the water 6 hours and 12 hours after it is placed in the freezer.
3. A ball is dropped from a height of 6 feet and begins bouncing. The height of each bounce is three-fourths the height of the previous bounce. Find the total vertical distance the ball travels before coming to rest.

Section 8.4

1. A fair coin is tossed seven times. What is the probability of obtaining four tails evaluating from the expansion $\left(\frac{1}{2} + \frac{1}{2}\right)^7$?
2. The probability of a baseball player getting a hit during any given at bat is $\frac{1}{4}$. Find the probability that the player gets three hits during the next 10 at bats.

Section 8.5

1. On a menu, there are 10 entrees, 7 sides, and 5 drinks. How many ways can you order an entrée, a side, and a drink?
2. A combination lock will open when the right choice of 3 numbers (from 1 to 30, inclusive) is selected. How many different combinations are possible?
3. In a certain state, each automobile license plate number consists of 2 letters followed by a 4-digit number. How many distinct license plate numbers are possible?
4. In how many different ways can eight children line up in a row?
5. A coin club has five members. In how many ways can a president and a vice president be selected?
6. Find the number of permutations of the word MISSISSIPPI?
7. In how many different ways can two people from the coin club (question #5) be chosen?
8. In a certain class, 4 students can be selected from a class of 20. How many different groups of 4 students are possible?
9. In a physiology class, a student must dissect 3 different specimens. The student can select one of 9 earthworms, one of four frogs, and one of seven fetal pigs. In how many ways can the student select the 3 specimens?
10. ATM personal ID numbers (PIN) codes typically consist of a 4-digit sequence of numbers.
 - a) Find the total number of ATM codes possible.
 - b) Find the total number of ATM codes possible when the first digit is not zero.
11. In how many orders can five girls and 3 boys walk through a doorway single file when
 - a) there are no restrictions?
 - b) the girls walk through before the boys?
12. How many different batting orders can a baseball coach create from a team of 15 players, when there are nine positions to fill?
13. You can answer any 12 questions from a total of 14 questions on an exam. In how many different ways can you select the questions?
14. Powerball is played with 59 white balls numbered 1-59 and 39 red balls numbered 1-39. Five white balls and one red ball, the Powerball, are drawn. In how many ways can a player of the game select six numbers?
15. You are dealt 5 cards from an ordinary deck of 52 playing cards. In how many ways can you get a full house?