4 Chapter Self-Test

1. A manufacturer uses a six-character serial number for a line of products. The first and second characters are upper-case letters (A to Z). The third, fourth, and fifth characters are digits (0 to 9). There are only three choices for the last position: A, B, and X.

a) How many different serial numbers are possible, if repetition of characters is allowed?

b) How many different serial numbers are possible, if no repetition is allowed?

2. How many different ways are there to draw 1 card that is a spade or a diamond from a standard deck of 52 cards?

3. Simplify each expression. State the restrictions on the variable.

a) $(n + 10)(n + 9)!$ **b)** $\frac{(n - 2)!}{n!}$

4. A parking lot attendant has 5 cars to park: 1 blue, 1 white, 1 red, and 2 black.

a) How many different ways can the 5 cars be parked side by side?

b) How many different ways can the cars be parked so the 2 black cars are next to each other?

5. A book club offers a selection of four books from a list of nine different titles.

a) How many different four-book selections can be made?

b) How many different four-book selections can be made if the four selections are listed in order of preference?

c) Why are the answers to parts a) and b) different? Explain.

6. Solve for n: ${}_nP_4 = 84({}_nC_2)$

7. David and Susan belong to a math club at their school. There are 6 boys and 8 girls in the club. How many different ways can a 5-person committee be selected from the 14 club members under each of the following conditions?

a) There must be 2 boys and 3 girls.

b) There must be at least 2 boys.

c) David and Susan must be on the committee.

d) There must be more girls than boys.

8. How many different arrangements are there of the letters in the word TEETH?

9. The nine members, five boys and four girls, of a softball team are arranging themselves in a line for a team photograph. For one of the poses, the photographer wants a boy on either side of each of the four girls. How many different arrangements are possible?

***WHAT** DO You Think Now?* Revisit **What Do You Think?** on page 227. Have your answers and explanations changed?