

## Practice

Student Edition  
Pages 712-717*The Counting Principle*Pick 3

Solve.

1. A briefcase lock has 3 rotating cylinders, each containing 10 digits. How many numerical codes are possible?
2. A golf club manufacturer makes irons with 7 different shaft lengths, 3 different grips, 5 different lies, and 2 different club head materials. How many different combinations are offered?
3. There are five different routes that a commuter can take from her home to the office. In how many ways can she make a round trip if she uses a different route coming than going?
4. In how many ways can the 4 call letters of a radio station be arranged if the first letter must be W or K and no letters repeat?
5. How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1?
6. How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1 and if no digit can be repeated?

## Practice

Student Edition  
Pages 718-725

## Permutations

How many different ways can the letters of each word be arranged?

1. CANADA  $\frac{6!}{3!}$

2. ILLINI

3. ANNUALLY

4. MEMBERS

Evaluate each expression.

5.  $\frac{8!}{6!}$

6.  $P(8, 6)$

7.  $\frac{P(7, 5)}{P(4, 3)}$

8.  $\frac{P(6, 5)P(4, 4)}{P(5, 1)P(9, 2)}$

9.  $\frac{P(8, 3)}{7!}$

10.  $\frac{P(7, 4) \cdot P(5, 3)}{P(6, 5)}$

Solve.

11. A photographer is taking a picture of a bride and groom together with 6 attendants. How many ways can he arrange the 8 people in a line if the bride and groom stand in the middle?

12. How many ways can 3 identical pen sets and 5 identical watches be given to 8 graduates if each receives one item?

13. How many ways can 4 charms be arranged on a bracelet that has no clasp?

14. How many ways can 4 charms be arranged on a bracelet that has a clasp?

15. How many ways can 5 men and 5 women be seated alternately at a round table?

16. How many ways can Laura and her 6 friends be seated around a table if Laura sits at the head of the table?

Pick 1

Pick 3

## Practice

**Combinations***Evaluate each expression.*

1.  $C(8, 2)$

2.  $C(11, 3)$

3.  $C(20, 18)$

4.  $C(9, 3) \cdot C(6, 2)$

*Solve for x.*

5.  $C(x, 7) = C(x, 2)$

6.  $C(11, 2) = C(x, 9)$

*Solve.*

7. How many 4-person bobsled teams can be chosen from a group of 9 athletes?

$$\frac{9!}{(9-4)! \cdot 4!} = \frac{9 \cdot 8 \cdot 7 \cdot 6}{4 \cdot 3 \cdot 2} = 126$$

8. From a dessert cart in a fine restaurant, customers are allowed to pick 3 desserts from the 10 that are displayed. How many combinations are possible?

9. How many diagonals does a polygon with 12 sides have?

10. How many 5-sided polygons can be formed by joining any 5 of 11 points located on a circle?

Pick 3

**An urn contains 8 white, 6 blue, and 9 red balls. How many ways can 6 balls be selected to meet each condition?**

11. All balls are red.

12. Three are blue, 2 are white, and 1 is red.

13. Two are blue, and 4 are red.

14. Exactly 4 balls are white.

