

12-2

Skills Practice

Permutations and Combinations

Evaluate each expression.

skip

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|---------------|---------------|---------------|---------------|
| 1. $P(6, 3)$ | 2. $P(8, 2)$ | Note | 3. $P(2, 1)$ |
| 4. $P(3, 2)$ | Note | 5. $P(10, 4)$ | $C(5, 3)$ |
| 6. $P(5, 5)$ | 7. $C(2, 2)$ | $P(6, 3)$ | 8. $C(5, 3)$ |
| 9. $C(4, 1)$ | 10. $C(8, 7)$ | $6P3$ | 11. $C(3, 2)$ |
| 12. $C(7, 4)$ | | | $5C3$ |

Determine whether each situation involves a permutation or a combination. Then find the number of possibilities.

13. seating 8 students in 8 seats in the front row of the school auditorium
 P. 40,320 8P8
14. introducing the 5 starting players on the Woodsville High School basketball team at the beginning of the next basketball game
 P 120 5P5
15. checking out 3 library books from a list of 8 books for a research paper
 C 56 8C3
16. choosing 2 movies to rent from 5 movies
 C 10 5C2
17. the first-, second-, and third-place finishers in a race with 10 contestants
 P 720 10·9·8 10P3
18. electing 4 candidates to a municipal planning board from a field of 7 candidates
 C 35 7C4
19. choosing 2 vegetables from a menu that offers 6 vegetable choices
 C 15 6C2
20. an arrangement of the letters in the word *rhombus*
 P 5040 7!
21. selecting 2 of 8 choices of orange juice at a store
 C 28 8C2
22. placing a red rose bush, a yellow rose bush, a white rose bush, and a pink rose bush in a row in a planter
 P 24 4P4 or 4!
23. selecting 2 of 9 kittens at an animal rescue shelter
 C 36 9C2
24. an arrangement of the letters in the word *isosceles*
 P 30,240 $\frac{9!}{3!2!}$

12-2 Practice

Permutations and Combinations

Evaluate each expression.

1. $P(8, 6)$

2. $P(9, 7)$

3. $P(3, 3)$

4. $P(4, 3)$

5. $P(4, 1)$

6. $P(7, 2)$

7. $C(8, 2)$

8. $C(11, 3)$

9. $C(20, 18)$

10. $C(9, 9)$

11. $C(3, 1)$

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

Determine whether each situation involves a *permutation* or a *combination*. Then find the number of possibilities.

13. selecting a 4-person bobsled team from a group of 9 athletes

C 126

9C4

14. an arrangement of the letters in the word *Canada*

P 120

$\frac{6!}{3!}$

15. arranging 4 charms on a bracelet that has a clasp, a front, and a back

P 24

16. selecting 3 desserts from 10 desserts that are displayed on a dessert cart in a restaurant

C 120

10C3

17. an arrangement of the letters in the word *annually*

P 5040

$\frac{8!}{2!2!2!}$

18. forming a 2-person sales team from a group of 12 salespeople

C 66

12C2

19. making 5-sided polygons by choosing any 5 of 11 points located on a circle to be the vertices

C 462

11C5

20. seating 5 men and 5 women alternately in a row, beginning with a woman

P 14,400

$5 \cdot 5 \cdot 4 \cdot 4 \cdot 3 \cdot 3 \cdot 2 \cdot 2 \cdot 1 \cdot 1$

21. **STUDENT GROUPS** Farmington High is planning its academic festival. All math classes will send 2 representatives to compete in the math bowl. How many different groups of students can be chosen from a class of 16 students?

C 120

16C2

22. **PHOTOGRAPHY** A photographer is taking pictures of a bride and groom and their 6 attendants. If she takes photographs of 3 people in a group, how many different groups can she photograph?

C 56

8C3

23. **AIRLINES** An airline is hiring 5 flight attendants. If 8 people apply for the job, how many different groups of 5 attendants can the airline hire?

C 56

8C5

24. **SUBSCRIPTIONS** A school librarian would like to buy subscriptions to 7 new magazines. Her budget, however, will allow her to buy only 4 new subscriptions. How many different groups of 4 magazines can she choose from the 7 magazines?

C 35

35