

Permutation Worksheet

I. Evaluate

1. $P(8,2)$

$$\frac{8!}{6!} = 8 \cdot 7$$

$$56$$

2. $P(9,1)$

$$\frac{9!}{8!} = 9$$

$$9$$

3. $P(7,5)$

$$\frac{7!}{2!} = 2,520$$

4. $P(12,6)$

$$\frac{12!}{6!} = 665,280$$

II. Solve each problem.

5. Find the number of possible ways the winner and first, second, and third runners-up in a contest with 10 finalists can be chosen.

$$10 \cdot 9 \cdot 8 \cdot 7 = {}^{10}P_4 = 5040$$

6. Find the number of possible ways the letters in the word "ALGEBRA" can be arranged.

$$\frac{7!}{2!} = 2,520$$

7. Find the number of possible ways an algebra book, a geometry book, a chemistry book, an English book, and a health book can be put on a shelf.

$$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

8. Find the number of possible ways the letters in the word "PARALLEL" can be arranged.

$$\frac{8!}{2! \cdot 3!} = 3,360$$

9. The manager of a four-screen movie theater is deciding which of 12 available movies to show. The screens are in rooms with different seating capacities. How many ways can he show four different movies on the screens?

$$12 \cdot 11 \cdot 10 \cdot 9 = 11,880$$

10. How many ways can 5 players huddle?

$$24 = (5-1)!$$

11. Find the number of possibilities that four different dishes can be put on a revolving tray in the middle of a table at a Chinese restaurant.

$$6 = (4-1)!$$

12. Find the number of ways that six quarters with designs from six different states arranged in a circle on top of your desk.

$$120 = (6-1)!$$

13. 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?

$$1440 = 6! \cdot 2$$

← Bride & Groom can switch

14. A person playing a word game has the following letters in the tray: QUOUNNTAGGRA. How many 12-letter arrangements could she make to check if a single word could be formed from all the letters?

$$29,937,600$$

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

$$56 = \frac{8!}{3!5!}$$

PPPWWWWWW

16. Three different hardcover books and five different paperbacks are placed on a shelf. How many ways can they be arranged if all the hardcover books are together?

$$4,320 = (3!)(5!) \cdot 6$$

17. In how many ways can 6 people stand in a ring around the player who is "it"?

$$120 = (6-1)!$$

18. In how many ways can 5 charms be placed on a bracelet with no clasp?

$$12 = \frac{(5-1)!}{2}$$

→ w/ CLASP it becomes Linear!
CAN FLIP