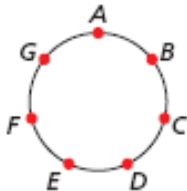


\*\*Show work for each problem on your own paper. Save this problem set for reference.\*\*

1. A camper can take 3 highways to the state park, then choose from 4 trails to the lake, and then choose from 3 trails to the cabins. How many routes are there to the cabins?
2. A password for a site consists of 4 digits followed by 2 letters. The only restriction is that the letters O and I may not be used. How many passwords are possible?
- 3a. A stylist has 8 vases for a store display. How many ways can she arrange all of them left to right in the store window?
- 3b. How many ways can the stylist arrange 5 of the 8 vases left to right in the store window?
4. How many ways can a club select its president, secretary, and treasurer from a group of 6 people?
5. Ryker and 10 other children in his pre-K class are lining up to go out to play. How many ways can they line up if Ryker is the line leader?
6. How many distinct permutations are there for the letters in the word MISSISSIPPI?
7. The display case in a jewelry store has 9 jewels: 4 rubies, 3 diamonds, and 2 emeralds. If jewels of the same type are considered identical, how many unique arrangements of the jewels are possible?
8. Simplify.
  - a.  ${}_{12}P_3$
  - b.  $\frac{4!3!}{2!}$
  - c.  $\frac{n!}{(n-3)!}$
9. How many ways can a student answer a 10-question true-false quiz?
10. Use the digits 0,1, 2, 3, 4 without repetition.
  - a. How many 3-digit numerals greater than 100 can be formed?
  - b. How many 4-digit numerals greater than 1000 but less than 4000 can be formed?
  - c. How many even 3-digit numerals can be formed?
11. Eight members of the Tiger Regiment are auditioning for 2 drum major positions. In how many ways can students be chosen to be drum majors?
12. How many ways can a student select 3 books to read from the summer reading list of 10 books?
13. How many ways can 4 points be selected to form a quadrilateral?



14. In the United Kingdom's National Lottery, you must correctly select a group of 6 numbers from 49. If the lottery rules were changed and you had to select 7 numbers, how many more ways would there be to select the numbers?

15. From the standard 52-card deck (see notes), how many ways are there to select 1 ace and 4 other cards that are not aces?
16. Your parents are buying you a new car. The model you want is available in 7 colors and has 10 different types of optional equipment that can be purchased. Your parents can only afford 2 of the options. How many combinations are available for your car?
16. A famous ice cream store offers 31 flavors of ice cream. How many ways could an ice cream cone with 2 or 3 different flavors be selected?
17. How many positive even integers less than 600 can be formed using the digits 2, 3, 4, 5, and 6, if digits may be repeated?
18. Eleven desks are available for 8 students. How many ways can they choose their seats?
19. There are 40 numbers on a combination lock. How many locker combinations are possible?
20. In a dog show, how many ways can 4 whippets, 5 Labradors, 2 poodles, and 3 French bulldogs line up in front of the judges, if dogs of the same breed are considered identical?
21. A relay race has 4 runners who run different parts of the race. There are 16 team members qualified to run in the relay race. In how many ways can a coach select 4 team members to compete in this race?
22. Four girls and three boys are to be seated at side-by-side at a long table. In how many ways can they be seated, if they must sit girl-boy-girl-boy-girl-boy-girl?

---

Answers

- |                       |                |
|-----------------------|----------------|
| 1. 36                 | 11. 28         |
| 2. 5,760,000          | 12. 120        |
| 3a. 40,320            | 13. 35         |
| 3b. 6,720             | 14. 71,916,768 |
| 4. 120                | 15. 778,320    |
| 5. 3,628,800          | 16. 4,960      |
| 6. 34,650             | 17. 75         |
| 7. 1,260              | 18. 6,652,800  |
| 8a. 1,320             | 19. 64,000     |
| 8b. 72                | 20. 2,522,520  |
| 8c. $n^3 - 3n^2 + 2n$ | 21. 43,680     |
| 9. 1,024              | 22. 144        |
| 10a. 48               |                |
| 10b. 72               |                |
| 10c. 27               |                |