

PERMUTATION

CANSU OLCE

A STAR MATHS (www.astarmaths.com.au)

1. There are 3 paths from point P to point Q and 5 paths from point Q to point R. Find the number of routes a boy can take to get from point P via point Q to point R using these points.
2. Two letter codes each made up of a consonant followed by a vowel is to be formed from the letters A, B, C, D, E, F and G. Find the number of different codes that can be formed.
3. Seven different toys are to be arranged in a row. How many different arrangements are there?
4. Five t-shirts of different colours are to be hung in a row. Find the number of different ways the t-shirts can be hung.
5. Six different prizes are to be given out to six students so that each student receives only one prize. Find the number of ways the prizes can be given out.
6. A scout sends out code messages by using 4 flags of different colours and arranging them in a row. Find the number of different messages the scout can send.

7. Four digit numbers are to be formed by using the digits from 1 to 9 without any digit being repeated. How many such numbers can be formed?

8. There are 7 seats in a row. 10 students are to be seated such that each seat is occupied by one student. Find the number of different ways the students can be seated.

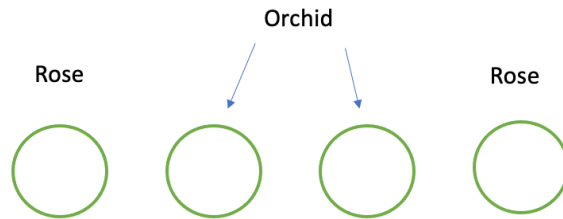
9.



6 televisions and 5 radios of different brands are to be displayed as shown in the diagram. Find the number of different arrangements that can be made.

10. 5 boys and 3 girls are to be seated in a row so that the boys are on the left and the girls are on the right. Find the number of different arrangements possible.

11.



3 pots of orchids and 4 pots of roses are to be arranged as shown in the diagram. How many different arrangements are possible?

12. The letters of the word 'CARING' are to be arranged in a row so that a vowel is at each end of the row. Find the number of different arrangements possible.

13. 3 boys and 2 girls are to stand in a row for a photo session. Find the number of different arrangements if the girls each want to stand

- a) at either end of the row
- b) next to each other

14. The letters A, E, P, Q, R and S are to be arranged in a row.

- a) Find the number of possible arrangements.
- b) If the two vowels must not be next to each other, find the number of possible arrangements.

15. How many different four-digit numbers can be formed using the digits from 1 to 9 without repetition if the numbers
- a) are even numbers?
 - b) are greater than 4000?
16. In a quiz, a participant is required to answer 5 questions out of 7 questions comprising 4 questions in German and 3 questions in English. Find the number of different orders the participant can answer the questions if he is required to answer
- a) a German question first
 - b) a German question first and an English question last.
17. A three digit number is to be formed by using the digits from 1 to 9 without repetition. Find the number of three-digit numbers that can be formed if
- a) the units digit is an odd number, the hundreds digit is an even number while there is no restriction on the tens digit.
 - b) the units digit and hundreds digit are odd numbers.
18. Calculate the number of different arrangements that can be formed if all the letters from the word 'BREAD' are to be arranged.
19. How many six digit numbers can be formed from the digits 1, 3, 5, 7, 8 and 9, without repetition?

20. Four letters from the word 'CONSIDER' are to be arranged. How many different arrangements are there?
21. Calculate the number of ways 4 runners can be arranged at the starting line of a six-lane track.
22. Calculate the number of permutations in which a car dealer can display his 5 cars, a WAJA, an ISWARA, a SAVVY, a WIRA and a PERDANA such that the WAJA must be in the first parking lot and the WIRA must be in the last parking lot.
23. Calculate the number of different arrangements that can be formed if all the letters from the word 'APRIL' are to be arranged with the condition that the vowels must be in the even positions, i.e. 2nd and 4th positions.
24. Calculate the number of different arrangements that can be formed if all the letters from the word 'SECTOR' are to be arranged with the condition that it must begin with a vowel?

25. Calculate the number of six-digit even numbers greater than 800 000 that can be formed from the digits 3, 4, 5, 6, 7 and 8, without repetitions.
26. Four letters from the word 'POWERFUL' are to be arranged with the condition that the first letter must be a vowel. Calculate the possible number of different arrangements.
27. Calculate the number of three-digit numbers greater than 400 that can be formed from the digits 3, 4, 5, 6 and 7 without repetition.
28. Calculate the number of four digit odd numbers that can be formed from the digits 5, 6, 7, 8 and 9 without repetition.
29. Calculate the number of four digit even numbers less than 5000 that can be formed from the digits 3, 4, 5, 6 and 9, without repetition.

30. Calculate the number of three-digit numbers greater than 450 that can be formed from the digits 3, 4, 5 and 6, without repetitions.

31. How many four-digit numbers less than 6000 can be formed from the prime numbers from 1 to 10, without repetitions?

32. At Ali electrical shop, there are 5 televisions which are of different brands and 4 DVD players which are also of different brands. Ali wants to display the electrical items as shown in the diagram.



Calculate the number of ways the items can be displayed.

33. Calculate the number of ways all the letters from the word 'ENGLISH' can be arranged with the condition that the vowels are side by side.

34. 4 different Physics books, 5 different Chemistry books and 6 different Biology books are to be arranged in a bookcase. If the books of the same subject have to be placed together, calculate the number of possible arrangements.

35. All the letters from the word 'POVERTY' are to be arranged. Calculate the number of possible arrangements if they must begin and end with a vowel.
36. Four cards are numbered 2, 3, 4 and 5. Calculate the number of different numbers that can be formed, without repetitions, using one or more than one or all the cards.
37. Three letters from the word 'MYTH' are to be arranged. Calculate the number of possible arrangements if the letter Y must be included.
38. Four boys and three girls are to be seated in a row. Calculate the number of possible arrangements
- a) if all the three girls have to be seated together.
 - b) A girl has to be seated at the centre.
39. How many 3-digit odd numbers can be formed from the digits 3, 4, 5, 6 and 7, without repetitions?

40. How many four-digit even numbers greater than 6000 can be formed from the digits 2, 3, 4, 5 and 6 without repetitions?
41. Five male students and four female students are to be seated in a row. Calculate the number of arrangements that can be done if two male students cannot sit next to each other.
42. If all the letters from the word 'KOMUTER' are to be arranged such that the vowels have to be in between the consonants, how many different words can be formed?

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ANSWER KEY

1. 15
2. 10
3. 5040
4. 120
5. 720
6. 24
7. 3024
8. 604800
9. 2400
10. 720
11. 72
12. 48
13. a)12 b)48
14. a)720 b)480
15. a)1344 b)2016
16. a)1440 b)720
17. a)140 b)140
18. 120
19. 720
20. 1680
21. 360
22. 6
23. 12
24. 240
25. 48
26. 630
27. 48
28. 72
29. 18
30. 16
31. 18
32. 480
33. 1440
34. 12441600
35. 240
36. 64
37. 18

38. a)720 b)2160

39. 36

40. 12

41. 2880

42. 144

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