

EXERCISE 6C

11.

PERMUTATIONS

12.

1. In how many ways can 10 people be arranged in a line?
2. How many permutations are there, of the letters taken all at a time, of:
 - (a) SPEEDIE;
 - (b) TROTTER;
 - (c) EASIER;
 - (d) EQUILATERAL.
3. In how many ways can 3 blue balls, 2 red balls and 4 purple balls be arranged in a line if the balls are identical except for colour?
4. In how many ways can the letters of the word "WARRAWEE" be arranged if the two letter Ws are on the ends?
5. In how many ways can the first three place getters be decided in a swimming race with 8 contestants?
6. Five candidates contest an election. In how many ways can their names be listed in a column on the ballot paper?
7. How many two digit numbers can be formed using the digits 6,7,8,9
 - (i) without repetition of digits ?
 - (ii) allowing repetition of digits ?
8. In how many ways can the 5 letters of the word "MANNA" be arranged in a row
 - (a) without restriction ?
 - (b) if the first and last letters are consonants ?
 - (c) so that the vowels and the consonants occupy alternate places?
9. In how many ways can the letters of the word "INCISION" be arranged in a row
 - (a) without restriction
 - (b) so that the three letter "I's" are together ?
 - (c) if the first and last letters are "I's" ?
10.
 - (a) In how many ways can eight fairy stories be arranged to form a book of fairytales.
 - (b) In how many of these ways will the longest story be last and the shortest story be first?
 - (c) In how many of these ways will the longest and shortest stories be next to each other?

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s be
11. How many three letter words can be formed if the letters are taken from the word FRIEND and letters are not repeated but the word must end in a vowel?
 12. In how many ways can 4 boys and 3 girls be arranged in a line if
 - (a) no restrictions apply
 - (b) the boys and girls alternate
 - (c) the boys and girls are in separate groups
 - (d) two particular boys A and B are to stay together
 13. Five persons enter an empty railway carriage in which there are 8 seats-4 facing the engine and 4 with their backs to the engine. In how many ways can they take their seats if
 - (a) any person can occupy any seat
 - (b) two particular persons X and Y sit facing the engine
 - (c) X sits in a corner
 - (d) X sits with his back to the engine whilst Y sits facing the engine
 14. Words of 4 letters are to be made from the letters of the word REASON with no letter being used more than once. How many words are possible if
 - (a) there are no restrictions
 - (b) each begins with R
 - (c) S is excluded
 - (d) both R and N are included
 - (e) R is included but E is excluded
 15. How many numbers greater than 4000 can be formed using the digits 0,1,2,3,4,5 without repetition of digits.
 16. Eight people enter a room and are seated in a row of 10 seats. If two particular people wish to sit together how many different arrangements are possible?

in a

ANSWERS

- in a
1. 3628800
 2. (a) 840; (b) 420; (c) 360; (d) 4989600
 3. 1260
 4. 90
 5. 336
 6. 120
 7. (i) 12 (ii) 16
 8. (a) 30; (b) 9; (c) 3.
 9. (a) 3360; (b) 360; (c) 360.
 10. (a) 40320 (b) 720 (c) 10080
 11. 40
 12. (a) 5040 (b) 144 (c) 288 (d) 1440
 13. (a) 6720 (b) 1440 (c) 3360 (d) 1920
 14. (a) 360 (b) 60 (c) 120 (d) 144 (e) 96
 15. 1320
 16. 362880
- ok of
d the
next

$$x(x+1)$$

$$(x+1) + x$$