

**Permutations**

24. Evaluate each of the following (*Show notation for the first one*)

${}_7P_7$

${}_5P_3$

${}_6P_5$

${}_4P_2$

25. In how many ways can six people be seated in a row of 6 seats?

26. a) In how many ways can 5 players be assigned to the 5 positions on a basketball team, assuming any player can play any position?

b) In how many ways can 10 players be assigned to the 5 positions?

27. How many different homes are available if a builder offers a choice of 5 basic plans, 3 roof styles and 2 exterior finishes?

28. A concert is to consist of 5 pieces of work : 2 modern, 2 classical and a piano concerto. In how many ways can the program be arranged?

29. In question 28. how many different programs are possible if the two modern works are to be played first, then the two classical and then the concerto?

30. a) How many 4 letter radio station call letters can be made if the first letter must be K or W and no letter can be repeated?

b) How many if repeats are allowed?

31. a) How many different license plate numbers (featuring 6 characters) can be formed using three letters followed by three digits if no repeats are allowed.

b) How many if there are no repeats and either letters or numbers come first?

**COMBINATIONS**

32. Evaluate each of the following (*Show notation for the first one*)

${}_6C_5$

${}_4C_2$

${}_8C_5$

${}_{10}C_2$

33. A club has 30 members, if a committee of 4 is selected in a random manner, how many combinations are possible?

34. How many different 2 card hands can be dealt from a deck of 52 cards?

35. Five cards are marked with the numbers 1, 2, 3, 4, 5 and then shuffled, and two cards are then drawn. How many different two card combinations are possible?

36. If a bag contains 3 green, 4 yellow and 8 white marbles, how many samples of two can be drawn in which both marbles are white?
37. In a club with 20 senior and 10 junior members, a committee of three is to be randomly selected. Find the probability that:
- the committee is composed entirely of senior members
  - the committee is composed entirely of junior members.
  - the committee is composed of entirely senior members or entirely junior members.

38. Binomial theorem – find the 5<sup>th</sup> term of  $(m - 2p)^{12}$

39. Find the 8<sup>th</sup> term for each of the following arithmetic sequences

$$a_1 = 5, d = 2$$

$$a_1 = 12, d = 6$$

$$a_1 = -4, d = 2$$

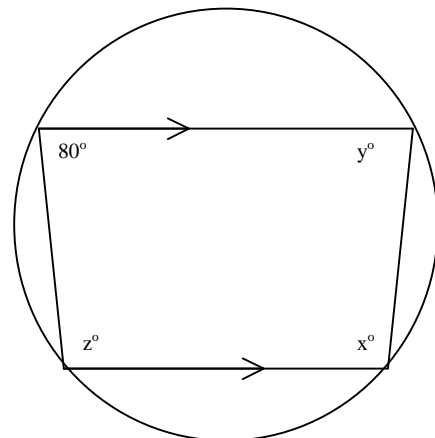
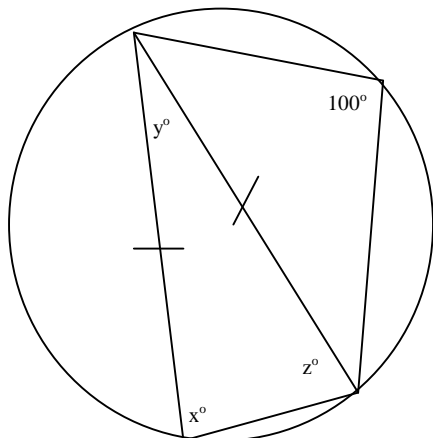
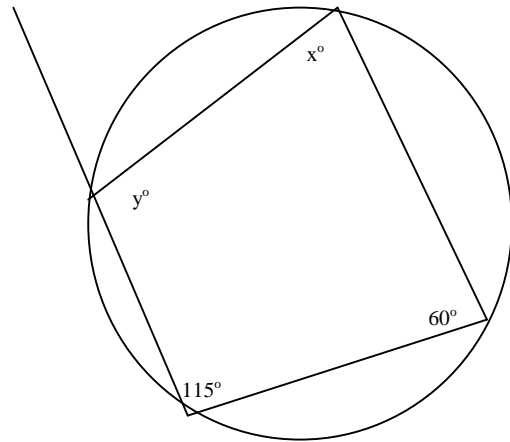
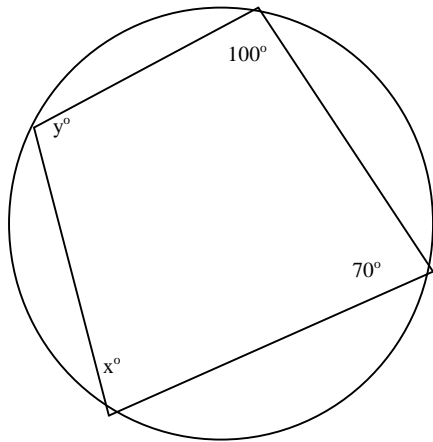
$$a_1 = 5, d = -2$$

40. Find the first five terms of the following sequences.

$$t_n = -3n + 2$$

$$t_1 = 10; \quad t_n = 4t_{(n-1)} + n^2$$

41. Find the variable values



## Permutations

24. Evaluate each of the following (Show notation for the first one)

${}_7P_7$

$7! = 5040$

${}_5P_3$

60

${}_6P_5$

720

${}_4P_2$

12

25. In how many ways can six people be seated in a row of 6 seats?

720

26. a) In how many ways can 5 players be assigned to the 5 positions on a basketball team, assuming any player can play any position?

120

b) In how many ways can 10 players be assigned to the 5 positions?

30 240

27. How many different homes are available if a builder offers a choice of 5 basic plans, 3 roof styles and 2 exterior finishes?

30

28. A concert is to consist of 5 pieces of work : 2 modern, 2 classical and a piano concerto. In how many ways can the program be arranged?

120

29. In question 28. how many different programs are possible if the two modern works are to be played first, then the two classical and then the concerto?

4

30. a) How many 4 letter radio station call letters can be made if the first letter must be K or W and no letter can be repeated?

24 288

b) How many if repeats are allowed?

31 200

31. a) How many different license plate numbers (featuring 6 characters) can be formed using three letters followed by three digits if no repeats are allowed.

11 232 000

b) How many if there are no repeats and either letters or numbers come first?

11 232 000

## COMBINATIONS

32. Evaluate each of the following (Show notation for the first one)

${}_6C_5$

$\frac{6!}{5!!!}, 6$

${}_4C_2$

6

${}_8C_5$

56

${}_{10}C_2$

45

33. A club has 30 members, if a committee of 4 is selected in a random manner, how many combinations are possible?

27 405

34. How many different 2 card hands can be dealt from a deck of 52 cards?

1326

35. Five cards are marked with the numbers 1, 2, 3, 4, 5 and then shuffled, and two cards are then drawn. How many different two card combinations are possible?

10

36. If a bag contains 3 green, 4 yellow and 8 white marbles, how many samples of two can be drawn in which both marbles are white? 28

37. In a club with 20 senior and 10 junior members, a committee of three is to be randomly selected. Find the probability that:

a) the committee is composed entirely of senior members

$$\frac{57}{203}$$

b) the committee is composed entirely of junior members.

$$\frac{6}{203}$$

c) the committee is composed of entirely senior members or entirely junior members.

$$\frac{9}{29}$$

38. Binomial theorem – find the 5<sup>th</sup> term of  $(m - 2p)^{12}$

$$7920m^8p^4$$

39. Find the 8<sup>th</sup> term for each of the following arithmetic sequences

$$a_1 = 5, d = 2$$

$$t_n = 2n + 3; \quad t_8 = 19$$

$$a_1 = 12, d = 6$$

$$t_n = 6n + 6; \quad t_8 = 54$$

$$a_1 = -4, d = 2$$

$$t_n = 2n - 6; \quad t_8 = 10$$

$$a_1 = 5, d = -2$$

$$t_n = -2n + 7; \quad t_8 = -9$$

40. Find the first five terms of the following sequences.

$$t_n = -3n + 2$$

$$-1, -4, -7, -10, -13$$

$$t_1 = 10; \quad t_n = 4t_{(n-1)} + n^2$$

$$10, 41, 168, 681, 2740$$

41. Find the variable values

