



CHAPTER-3: TRIGONOMETRY

1. A horse is tied to a post by a rope. If the horse moves along a circular path always keeping the rope tight and describes 88 m when it has traced out 72° at the centre, find the length of the rope.
2. A circular wire of radius 7.5 cm is cut and bent so as to lie along the circumference of a hoop whose radius is 120 cm. Find in degrees the angle which is subtended at the centre of the hoop.
3. If the angular diameter of the moon be 30° , how far from the eye a coin of diameter 2.2 cm be kept to hide the moon?
4. The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes?
5. A rail road curve is to be laid out on a circle. What radius should be used if the track is to change direction by 25° in a distance of 40 meters?

CHAPTER-6: LINEAR INEQUALITIES

6. Find all pairs of consecutive even numbers both of which are greater than 5 and the sum of the numbers is less than 23.
7. A company manufactures cassettes and its cost and revenue function for a week are as follows:

$$C = 300 + \frac{3}{2}x \text{ and } R = 2x$$

where x is the number of cassettes produced and sold in a week. How many cassettes must be sold in a week to realize a profit?

8. The water acidity in a pool is considered normal when the average pH acidity of three daily measurements is between 7.2 and 7.8. If the first two pH readings are 7.48 and 7.85, find the range of pH value for the third reading that will result in acidity level being normal.
9. In drilling world's deepest hole, it was found that the temperature T in degree Celsius, x km below the earth's surface was given by $T = 30 + 25(x - 3)$ where $3 \leq x \leq 15$. At what depth will the temperature be between 155°C and 205°C ?
10. A manufacturer has 600 l of a 12% solution of acid. How many litres of a 30 % acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%?

CHAPTER-7: PERMUTATIONS AND COMBINATIONS

11. How many automobile license plates can be made, if each plate contains two different letters followed by three different digits?
12. Eighteen guests are to be seated, half on each side of a long table. Four particular guests desire to sit on one particular side and three others on other side of the table. Find the number of ways in which the seating arrangement can be made.
13. If the letters of the word 'MOTHER' are written in all possible orders and these words are written in dictionary, then what is the rank of the word 'MOTHER'?
14. Find the number of different words that can be formed from the letters of the word "TRIANGLE" so that no vowels are together.
15. We wish to select 6 persons from 8 but if the person A is chosen, then B must be chosen. In how many ways can the selection be made?