

LASS : XI
MATHEMATICS

M.M : 50
TIME : 1½ Hrs

Each question carries 2 marks.

(2 x 10 = 20)

A line passing through the points $(a, 2a)$ and $(-2, 3)$ is perpendicular to the line $4x + 3y + 5 = 0$, find a . ✓

Find the centre and radius of the circle $5x^2 + 5y^2 + 4x - 8y = 16$.

If the equation of two diameters of a circle $2x + y = 6$ and $3x + 2y = 4$ and its radius is 10 units, find its equation.

✓ If $\frac{m+n}{p_2} = 90$ and $\frac{m-n}{p_2} = 30$, find m and n .

How many different garlands can be made with 14 flowers of different colours if 6 particular flowers are always together. ✓

Find the number of diagonals of a convex polygon of 12 sides. ✓ ✓

From 5 apples, 4 oranges and 3 mangoes how many selections of fruits can be made. ✓

If $\angle 135$ is divisible by 3^n , find the maximum value of n .

$$4 \times 5 \times 4 = 120 - 1 = 119$$

✓ solve $4\sin^2 \theta = 1$. ✓

✓ Find the coefficient of x^{39} in $(1 + 3x + 3x^2 + x^3)^{15}$.

SECTION - B

(5 x 6 = 30)

Each question carries 5 marks.

1. Find the image of the point $(-8, 12)$ in the mirror line $4x + 7y + 13 = 0$.

OR

2. Find the equation of the line passing through the point of intersection of $2x + y = 1$, and $x + 3y = 2$ and making with the x and y-ordinate axes a triangle of area $\frac{3}{8}$ units.3. Prove that the circles $x^2 + y^2 + 2x + 2y + 1 = 0$ and $x^2 + y^2 - 4x - 6y - 3 = 0$ touch each other.

OR

4. Prove that the line $4x - 3y + 23 = 0$ touches the circle $x^2 + y^2 - 6x + 10y - 66 = 0$.5. Find the total number of ways of selecting 5 letters from the letters of the word **Independent**.6. If x, y, z along with 7 other speakers are to address a gathering, In how many ways can they do if.

- i) there is no restriction
- ii) x, y, z are three consecutive speakers in that order
- iii) x, y, z are three consecutive speakers in any order.
- iv) x speaks before y and y speaks before z .

7. If 2^{nd} , 3^{rd} and 4^{th} terms in the expansion of $(a+b)^n$ are $135, 30$ and $10/3$ respectively, find a, b and n .

OR

8. If coefficients of 5^{th} , 6^{th} and 7^{th} terms in $(1+x)^n$ are in A.P., find n .9. Solve the equation $\cot \theta + \operatorname{cosec} \theta = \sqrt{3}$ OR $\tan \theta + \tan(\theta + \pi/3) + \tan(\theta + \frac{2\pi}{3}) = 3$.