CLASS XI
SAMPLE PAPER
MATHS

GROUP-I : (ONE mark each)

1. Express the Cartesian equation $x^2 + y^2 - 2xa = 0$ in polar form.
2. If two sides of a square lie on the lines $5x - 2y = 13$ and $10x - 4y + 16 = 0$, then find the area of the square.
3. $(6, 2)$ and $(-1, 7)$ are coordinates of the mid-points of two sides of ΔABC. If its centroid is the point $(0, 5)$, then find the coordinates of the mid-point of the third side.

GROUP-II : (TWO marks each)

4. Prove that the points $(2, -2)$, $(8, 4)$, $(5, 7)$ and $(-1, 1)$, if joined in order, will form a rectangle.
5. Find the equation of the locus of the moving point, whose distances from the points $(3, 4)$ and $(1, -2)$ is in the ratio $2 : 3$.
6. Find the equation of the straight line having intercepts equal in magnitude but opposite in sign from the rectangular Cartesian coordinate axes and passing through the point of intersection of the straight lines $x + 3y + 4 = 0$ and $2x - y - 13 = 0$.
7. Prove that the straight lines $x+2y-1=0$, $x+2y+5=0$, $2x+y+1=0$ and $2x+y+7=0$ taken in order form a rhombus.
8. If $a + b + c = 0$, then show that, the straight lines $ax + by + c = 0$, $bx + cy + a = 0$ and $cx + ay + b = 0$ are concurrent.

GROUP-III : (THREE marks each)

9. Prove that any point on the straight line $11x - 3y + 11 = 0$ is equidistant from the straight lines $3x - 4y + 3 = 0$ and $12x + 5y + 12 = 0$.
10. Find equations of the straight lines parallel to $3x+4y=15$ & at a distance of 7.5 unit from $(1, -2)$.
11. Prove that the area of the triangle formed by the straight lines $y = m_1x + c_1$; $y = m_2x + c_2$ and y-axis is $\dfrac{1}{2}\dfrac{(c_1 - c_2)^2}{|m_2 - m_1|}$ $(m_1 \neq m_2)$.
12. A ray of light is sent along the line $x - 2y + 5 = 0$. On reaching the line $3x - 2y + 7 = 0$, the ray is reflected from it. Find the equation of the line containing the reflected ray.
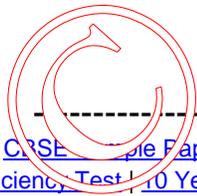
GROUP-IV :   (FOUR marks each)

13.   Find the coordinates of the image of the point $(5, -7)$ with respect to $2x - 3y = 18$.

14.   Find the equations of the bisectors of the angles between the straight lines $3x+4y+1= 0$ and $8x- 6y- 3 = 0$. Hence indentify the bisector, which bisects the angle containing the origin.

OR,   *The equations of the diagonals of a rectangle of area 8 sq-units are $2x + y = 10$ & $2x - y = 6$. Find the equations of the sides of the rectangle.

"*The Algebra is but a Geometry in writing:*

the Geometry is but an Algebra enfigured." – Sophie Germain.

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✦ *Confidence* ✦

"*Arise! Awake! Stop not till the Goal is reached*"