



PARISHRAM ACADEMY

NAME of Student : _____

Subject : Maths

Class : XII

State

Topic :- 4 – Pair of Straight Lines

M. M. :- 40

SECTION – A (8 Marks)

Q. 1. Multiple choice questions:

- (i) If the equation $3x^2 - 8xy + qy^2 + 2x + 14y + p = 1$ represents a pair of perpendicular lines, then the value of p and q are respectively.
(a) 7 and 3 (b) -7 and 3 (c) -3 and -7 (d) -7 and -3
- (ii) The joint equation of pair of lines having slopes 1 and 3 and passing through the origin is
(a) $4x^2 - 3xy - y^2 = 0$ (b) $3x^2 - 4xy + y^2 = 0$ (c) $3x^2 - 4xy - y^2 = 0$ (d) $3x^2 = y^2$
- (iii) The equation $4x^2 - 24xy + 11y^2 = 0$ represents
(a) two parallel lines (b) two perpendicular lines
(c) two lines through the origin (d) a circle
- (iv) The point of intersection of the lines $2x^2 - 5xy + 3y^2 + 8x - 9y + 6 = 0$ is
(a) (-3, 4) (b) (3, -5) (c) (3, 4) (d) (-3, -5)

SECTION – B (8 Marks)

Solve Any Four

- Q. 2. Find the separate equations of the lines represented by the equation $3x^2 - 10xy - 8y^2 = 0$
- Q. 3. Find the value of k, if the equation $3x^2 + 10xy + 3y^2 + 16y + k = 0$, represents a pair of lines.
- Q. 4. Find the value of p and q, if the equation $9x^2 - 6xy + py^2 + 2qx + 6y + 1 = 0$ represents pair of parallel lines.
- Q. 5. Polar co-ordinates of the point whose Cartesian co-ordinates are $(1, \sqrt{3})$.
- Q. 6. Find p and q if the equation $2x^2 - 6xy + py^2 - 4x + 6y + q = 0$, a pair of perpendicular lines.
- Q. 7. Find the value of k, if the slope of one of the lines given by $4x^2 + kxy + y^2 = 0$ is four times the other.

SECTION – C (12 Marks)

Solve Any Four

- Q. 8. If θ is the measure of acute angle between the pair of lines given $ax^2 + 2hxy + by^2 = 0$ by, then prove that $\tan \theta = \left| \frac{2\sqrt{h^2 - ab}}{a + b} \right|, a + b \neq 0$.
- Q. 9. If the slope of one of the lines by $ax^2 + 2hxy + by^2 = 0$, is three the other, prove that $3h^2 = 4ab$.
- Q. 10. Find the acute angle between the pair of lines given by $(l^2 - 3m^2)x^2 + 8lmxy + (m^2 - 3l^2)y^2 = 0$
- Q. 11. Show that the joint equation of lines passing through the origin and each making an angle α with line $x + y = 0$ is $x^2 + 2xy \sec 2\alpha + y^2 = 0$
- Q. 12. Find acute angle θ between the lines $3x^2 + 2xy - y^2 = 0$
- Q. 13. Find p and q, if the following equation represents a pair of perpendicular lines
 $2x^2 + 4xy - py^2 + 4x + qy + 1 = 0$

SECTION – D (12 Marks)

Solve Any Three

- Q. 14. Equations of pairs of opposite sides of parallelogram are $x^2 - 7x + 6 = 0$ and $y^2 - 14y + 40 = 0$. Find the joint equation of its diagonals.

- Q. 15. If the lines given by $ax^2 + 2hxy + by^2 = 0$ form an equilateral triangle with the line $lx + my = 1$, then show that $(3a + b)(a + 3b) - 4h^2 = 0$
- Q. 16. Prove that every homogeneous equation of second degree in x and y, i.e., $ax^2 + 2hxy + by^2 = 0$ represents a pair of lines through the origin, if $h^2 - ab \geq 0$
- Q. 17. Find the condition that the line $3x - 2y = 0$ coincides with one of the lines given by $ax^2 + 2hxy + by^2 = 0$.
- Q. 18. Find the joint equation of pair of lines passing through the origin and perpendicular to the lines represented by $ax^2 + 2hxy + by^2 = 0$