

Pairs of straightline

1. Equation of pair of straight lines drawn through (1, 1) and perpendicular to the pair of lines $3x^2 - 7xy - 2y^2 = 0$ is
 (a) $2x^2 + 7xy - 11x + 6 = 0$ (b) $2(x-1)^2 + 7(x-1)(y-1) - 3y^2 = 0$
 (c) $2(x-1)^2 + 7(x-1)(y-1) + 3(y-1)^2 = 0$ (d) None of these
2. Pair of straight lines perpendicular to each other represented by
 (a) $2x^2 = 2y(2x+y)$ (b) $x^2 + y^2 + 3 = 0$ (c) $2x^2 = y(2x+y)$ (d) $x^2 = 2(x-y)$
3. If the equation $ax^2 + 2hxy + by^2 = 0$ has the one line as the bisector of angle between the coordinate axes, then
 (a) $(a-b)^2 = h^2$ (b) $(a+b)^2 = h^2$ (c) $(a-b)^2 = 4h^2$ (d) $(a+b)^2 = 4h^2$
4. The lines joining the origin to the points of intersection of the line $y = mx + c$ and the circle $x^2 + y^2 = a^2$ will be mutually perpendicular, if
 (a) $a^2(m^2 + 1) = c^2$ (b) $a^2(m^2 - 1) = c^2$ (c) $a^2(m^2 + 1) = 2c^2$ (d) $a^2(m^2 - 1) = 2c^2$
5. The angle between lines joining the origin to the points of intersection of the line $x\sqrt{3} + y = 2$ and the curve $x^2 + y^2 = 4$ is
 (a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$
6. Let PQR be a right angled isosceles triangle, right angled at $P(2,1)$. If the equation of the line QR is $2x + y = 3$, then the equation representing the pair of lines PQ and PR is
 (a) $3x^2 - 3y^2 + 8xy + 20x + 10y + 25 = 0$ (b) $3x^2 - 3y^2 + 8xy - 20x - 10y + 25 = 0$
 (c) $3x^2 - 3y^2 + 8xy + 10x + 15y + 20 = 0$ (d) $3x^2 - 3y^2 - 8xy - 10x - 15y - 20 = 0$
7. If the pair of lines $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ intersect on the y -axis, then
 (a) $2fgh = bg^2 + ch^2$ (b) $bg^2 \neq ch^2$ (c) $abc = 2fgh$ (d) None of these
8. The point of intersection of the lines represented by equation $2(x+2)^2 + 3(x+2)(y-2) - 2(y-2)^2 = 0$ is
 (a) (2, 2) (b) (-2, -2) (c) (-2, 2) (d) (2, -2)
9. If $y = mx$ be one of the bisectors of the angle between the lines $ax^2 - 2hxy + by^2 = 0$, then
 (a) $h(1+m^2) + m(a-b) = 0$ (b) $h(1-m^2) + m(a+b) = 0$ (c) $h(1-m^2) + m(a-b) = 0$ (d) $h(1+m^2) + m(a+b) = 0$
10. The combined equation of the bisectors of the angle between the lines represented by $(x^2 + y^2)\sqrt{3} = 4xy$ is
 (a) $y^2 - x^2 = 0$ (b) $xy = 0$ (c) $x^2 + y^2 = 2xy$ (d) $\frac{x^2 - y^2}{\sqrt{3}} = \frac{xy}{2}$
11. One bisector of the angle between the lines given by $a(x-1)^2 + 2h(x-1)y + by^2 = 0$ is $2x + y - 2 = 0$. The other bisector is
 (a) $x - 2y + 1 = 0$ (b) $2x + y - 1 = 0$ (c) $x + 2y - 1 = 0$ (d) $x - 2y - 1 = 0$
12. The angle between the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$ is given by
 (a) $\tan \theta = \frac{2(h^2 - ab)}{(a+b)}$ (b) $\tan \theta = \frac{2\sqrt{(h^2 - ab)}}{(a+b)}$ (c) $\tan \theta = \frac{2(h^2 - ab)}{\sqrt{a+b}}$ (d) $\tan \theta = \frac{2\sqrt{h^2 + ab}}{(a+b)}$
13. The angle between the pair of straight lines $x^2 - y^2 - 2y - 1 = 0$, is
 (a) 90° (b) 60° (c) 75° (d) 36°
14. If the equation $ax^2 + 2hxy + by^2 = 0$ represents two lines $y = m_1x$ and $y = m_2x$, then
 (a) $m_1 + m_2 = \frac{-2h}{b}$ and $m_1m_2 = \frac{a}{b}$ (b) $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = \frac{-a}{b}$
 (c) $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = \frac{a}{b}$ (d) $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = -ab$
15. Difference of slopes of the lines represented by equation $x^2(\sec^2 \theta - \sin^2 \theta) - 2xy \tan \theta + y^2 \sin^2 \theta = 0$ is
 (a) 4 (b) 3 (c) 2 (d) None of these