Straight Lines

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C. Mcq with one correct answer

6. If the sum of the distances of a point from two perpendicular lines in a plane is 1, then its locus is (1992)
   (a) Square
   (b) Straight Line
   (c) Circle
   (d) Two intersecting lines

7. The locus of a variable point whose distance from $(-2, 0)$ is $\frac{2}{3}$ times its distance from the line x=$\frac{-9}{2}$ (1994)
   (a) ellipse
   (b) hyperbola
   (c) parabola
   (d) None of these

8. The equations to a pair of opposite sides of parallelogram are $x^2 - 5x + 6 = 0$ and $y^2 - 6y + 5$, the equations to its diagonals are (1994)
   (a) $x + 4y = 13, y = 4x - 7$
   (b) $4x + y = 13, 4y = x - 7$
   (c) $4x + y = 13, y = 4x - 7$
   (d) $y - 4x = 13, y + 4x = 7$

9. The orthocentre of the triangle formed by the lines $xy = 0$ and $x + y = 1$ is (1994)
   (a) $\left(\frac{1}{2}, \frac{1}{2}\right)$
   (b) $\left(\frac{1}{3}, \frac{1}{3}\right)$
   (c) $(0, 0)$
   (d) $\left(\frac{1}{4}, \frac{1}{4}\right)$

10. 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 (1999)
   (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) $3x^2 - 3y^2 - 8xy - 10x - 15y - 20 = 0$

11.If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G·P with the same common ratio, then the points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ (1999)
   (a) lie on a straight line
   (b) lie on an ellipse
   (c) lie on a circle
   (d) are vertices of a triangle

12. Let PS be the median of the triangle with vertices $P(2, 2)$,$Q(6, -1)$ and $R(7, 3)$.The equation of the line passing through $(1, 1)$ and parallel to PS is (2000S)
   (a) $2x - 9y - 7 = 0$
   (b) $2x - 9y - 11 = 0$
   (c) $2x + 9y - 11 = 0$
   (d) $2x + 9y + 7 = 0$

13. The incentre of the triangle with vertices $\left(1, \sqrt{3}\right), (0, 0), and\, (2, 0)$ is (2000S)
   (a) $\left(1, \frac{\sqrt{3}}{2}\right)$
   (b) $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$
   (c) $\left(\frac{2}{3}, \frac{\sqrt{3}}{2}\right)$
   (d) $\left(1, \frac{1}{\sqrt{3}}\right)$

14. The number of integer values for m, for which the x-coordinate of the point of intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer,is (2001S)
   (a) 2
   (b) 0
   (c) 4
   (d) 1

15. Area of the parallelogram formed by the lines $y = mx$,$y = mx + 1$,$y = nx$, and $y = nx + 1$ equals (2001S)
   (a) $\frac{|m+n|}{(m-n)^2}$
   (b) $\frac{2}{|m+n|}$
   (c) $\frac{1}{|m+n|}$
   (d) $\frac{1}{|m-n|}$

16. Let $0<\alpha<\frac{\pi}{2}$ be fixed angle if $P = (\cos\theta, \sin\theta)$ and $Q = (\cos(\alpha - \theta), \sin(\alpha - \theta))$, then Q is obtained from P by (2002S)
   (a) clockwise rotation around origin through an angle α
   (b) anticlockwise rotation around origin through an angle α

(c) reflection in the line through origin with slope $\tan\alpha$

(d) reflection in the line through origin with slope $\tan\left(\frac{\alpha}{2}\right)$

17. Let $P = (-1, 0)$, $Q = (0, 0)$, and $R = \left(3, 3\sqrt{3}\right)$ be three points. Then the equation of the bisector of the angle PQR is. (2002S)

(a) $\frac{\sqrt{3}}{2}x + y = 0$

(b) $x + \sqrt{3}y = 0$

(c) $\sqrt{3}x + y = 0$

(d) $x + \frac{\sqrt{3}}{2}y = 0$

18. A straight line through the origin O meets the parallel lines $4x + 2y = 9$ and $2x + y + 6 = 0$ at points P and Q respectively. Then the point O divides the segment PQ in the ratio (2002S)

(a) $1:2$

(b) $3:4$

(c) $2:1$

(d) $4:3$

19. The number of integral points (integral points means both the coordinates should be integer) exactly in the interior of the triangle with vertices $(0, 0)$, $(0, 21)$, and $(21, 0)$ is (2003S)

(a) 133

(b) 190

(c) 233

(d) 105

20. Orthocentre of triangle with vertices $(0, 0)$, $(3, 4)$, and $(4, 0)$ is (2003S)

(a) $\left(3, \frac{5}{4}\right)$

(b) $(3, 12)$

(c) $\left(3, \frac{3}{4}\right)$

(d) $(3, 9)$