

Assignment-3

AI24BTECH11036- Shreedhanvi Yadlapally

I. JEE MAIN / AIEEE

- 1) Let $\mathbf{P} = (-1, 0)$, $\mathbf{Q} = (0, 0)$ and $\mathbf{R} = (3, 3\sqrt{3})$ be three points. The equation of the bisector of the angle PQR is [2007]
 - a) $\frac{\sqrt{3}}{2}x + y = 0$
 - b) $x + \sqrt{3}y = 0$
 - c) $\sqrt{3}x + y = 0$
 - d) $x + \frac{\sqrt{3}}{2}y = 0$
- 2) If one of the lines of $my^2 + (1 - m^2)xy - mx^2 = 80$ is a bisector of the angle between the lines $xy = 0$, then m is [2007]
 - a) 1
 - b) 2
 - c) $-\frac{1}{2}$
 - d) -2
- 3) The perpendicular bisector of the line segment joining $\mathbf{P}(1, 4)$ and $\mathbf{Q}(k, 3)$ has y-intercept -4. Then a possible value of k is [2008]
 - a) 1
 - b) 2
 - c) -2
 - d) -4
- 4) The shortest distance between the line $y - x = 1$ and the curve $x = y^2$ is [2009]
 - a) $\frac{2\sqrt{3}}{8}$
 - b) $\frac{3\sqrt{2}}{5}$
 - c) $\frac{\sqrt{3}}{4}$
 - d) $\frac{3\sqrt{2}}{8}$
- 5) The lines $p(p^2 + 1)x - y + q = 0$ and $(p^2 + 1)^2x + (p^2 + 1)y + 2q = 0$ are perpendicular to a common line for : [2009]
 - a) exactly one values of p
 - b) exactly two values of p
 - c) more than two values of p
 - d) no value of p
- 6) Three distinct points \mathbf{A} , \mathbf{B} and \mathbf{C} are given in the 2-dimensional coordinates plane such that the ratio of the distance of any one of them from the point $(1, 0)$ to the distance from the point $(-1, 0)$ is equal to $\frac{1}{3}$. Then the circumcentre of the triangle ABC is at the point: [2009]
 - a) $(\frac{5}{4}, 0)$
 - b) $(\frac{5}{2}, 0)$
 - c) $(\frac{5}{3}, 0)$
 - d) $(0, 0)$
- 7) The line L given by $\frac{x}{5} + \frac{y}{b} = 1$ passes through the point $(13, 32)$. The line K is parallel to the line L and has the equation $\frac{x}{c} + \frac{y}{3} = 1$. Then the distance between L and K is [2010]
 - a) $\sqrt{17}$
 - b) $\frac{17}{\sqrt{15}}$
 - c) $\frac{23}{\sqrt{17}}$
 - d) $\frac{23}{\sqrt{15}}$
- 8) Lines $L_1 : y - x = 0$ and $L_2 : 2x + y = 0$ intersect the line $L_3 : y + 2 = 0$ at P and Q , respectively. The bisector of the acute angle between L_1 and L_2 intersects L_3 at R .
STATEMENT-1 : The ratio $PR : RQ$ equals $2\sqrt{2} : \sqrt{5}$.
STATEMENT-2 : In any triangle, bisector of an angle divides the triangle into two similar triangles.

[2011]

- a) Statement-1 is True, Statement-2 is True Statement-2 is not a correct explanation for Statement-1
 b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
 c) Statement-I is True, Statement-2 is False
 d) Statement-1 is False, Statement-2 is True.

- 9) If the line $2x + y = k$ passes through the point which divides the line segment joining the points (1, 1) and (2, 4) in the ration 3:2, then k equals: [2012]

- a) $\frac{29}{5}$ b) 5 c) 6 d) $\frac{11}{5}$

- 10) A ray of light along $x + \sqrt{3}y = \sqrt{3}$ gets reflected upon reaching the x-axis, the equation of the reflected ray is [JEE M 2013]

- a) $y = x + \sqrt{3}$ c) $y = \sqrt{3}x - \sqrt{3}$
 b) $\sqrt{3}y = x - \sqrt{3}$ d) $\sqrt{3}y = x - 1$

- 11) The x-coordinate of the incentre of the triangle that has the coordinates of mid points of its sides as (0, 1), (1, 1) and (1, 0) is:

[JEE M 2013]

- a) $2 + \sqrt{2}$ b) $2 - \sqrt{2}$ c) $1 + \sqrt{2}$ d) $1 - \sqrt{2}$

- 12) Let PS be the median of the triangle with vertices $\mathbf{P}(2, 2)$, $\mathbf{Q}(6, -1)$ and $\mathbf{R}(7, 3)$. The equation of the line passing through (1, -1) and parallel to PS is: [JEE M 2014]

- a) $4x + 7y + 3 = 0$ c) $4x - 7y - 11 = 0$
 b) $2x - 9y - 11 = 0$ d) $2x + 9y + 7 = 0$

- 13) Let a, b, c and d be non-zero numbers. If the point of intersection of the lines $4ax + 2ay + c = 0$ and $5bx + 2by + d = 0$ lies in the fourth quadrant and is equidistant from the two axes then [JEE M 2014]

- a) $3bc - 2ad = 0$ c) $2bc - 3ad = 0$
 b) $3bc + 2ad = 0$ d) $2bc + 3ad = 0$

- 14) The number of points, having both co-ordinates as integers, that lie in the interior of the triangle with vertices (0, 0), (0, 41) and (41, 0) is:

[JEE M 2015]

- a) 820 b) 780 c) 901 d) 861

- 15) Two sides of a rhombus are along the lines, $x - y + 1 = 0$ and $7x - y - 5 = 0$. If its diagonals intersect at (-1, -2), then which one of the following is a vertex of this rhombus?

[JEE M 2016]

- a) $\left(\frac{1}{3}, -\frac{8}{3}\right)$ c) $(-3, -9)$
 b) $\left(-\frac{10}{3}, -\frac{7}{3}\right)$ d) $(-3, -8)$

- 16) A straight the through a fixed point (2, 3) intersects the coordinate axes at distinct points \mathbf{P} and \mathbf{Q} . If \mathbf{O} is the origin and the rectangle $OPRQ$ is completed, then the locus of R is:

[JEE M 2018]

a) $2x + 3y = xy$

c) $3x + 2y = 6xy$

b) $3x + 2y = xy$

d) $3x + 2y = 6$

- 17) Consider the set of all lines $px + qy + r = 0$ such that $3p + 2q + 4r = 0$. Which one of the following statements is true?

[JEE M 2019- 9 Jan (M)]

a) The lines are concurrent at the point $\left(\frac{3}{4}, \frac{1}{2}\right)$

b) Each line passes through the origin.

c) The lines are all parallel.

d) The lines are not concurrent.

- 18) Slope of a line passing through $\mathbf{P}(2, 3)$ and intersecting the line $x + y = 7$ at a distance of 4 units from \mathbf{P} , is:

[JEE M 2019- 9 April(M)]

a) $\frac{1-\sqrt{5}}{1+\sqrt{5}}$

c) $\frac{\sqrt{7}-1}{\sqrt{7}+1}$

b) $\frac{1-\sqrt{7}}{1+\sqrt{7}}$

d) $\frac{\sqrt{5}-1}{\sqrt{5}+1}$