COORDINATE SYSTEM

PREVIOUS EAMCET BITS

1. If, *l*, m, n are in arithmetic progression, then the straight line *l*x + my + n = 0 will pass through the point **[EAMCET 2008]**

   1) (–1, 2) 2) (1, –2) 3) (1, 2) 4) (2, 1)

   Ans: 2

Sol. *l*, m, n are in A.P $\Rightarrow$ m – *l* = n – m $\Rightarrow$ *l* – 2m + n = 0 $\Rightarrow$ (1, –2) lies on *l*x + my + n = 0

2. In the triangle with vertices at $A(6,3), B(-6,3)$ and $C(-6,-3)$, the median through A meets BC at P, the line AC meets the x-axis at Q, while R and S respectively denote the orthocentre and centroid of the triangle. Then the correct matching of the coordinates of points in List – I to List – II is **[EAMCET 2007]**

List – I	**List – II**
i) P	A) (0, 0)
ii) Q	B) (6, 0)
iii) R	C) (–2, 1)
iv) S	D) (–6, 0)
	E) (–6, –3)
	F) (–6, 3)

	i	ii	iii	iv		i	ii	iii	iv
1)	D	A	E	C	2)	D	B	E	C
3)	D	A	F	C	4)	B	A	F	C

Ans: 3

Sol. i) P is midpoint of BC = (–6, 0) = D

ii) Midpoint of AC is (0, 0) $\Rightarrow$ AC meets x-axis at Q(0, 0) = A

iii) ΔABC is right angled at B. Orthocentre = R = (–6, 3) = F

iv) Centroid = S = (–2, 1) = C

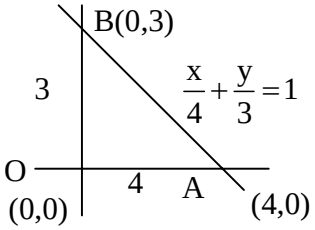
3. The area (in square units) of the triangle formed by the lines x = 0, y = 0 and 3x + 4y = 12 is **[EAMCET 2005]**

   1) 3 2) 4 3) 6 4) 12

   Ans: 3

Sol. Area of Δle OAB = $\frac{1}{2}$ base $\times$ height

$$\text{Area} = \frac{1}{2} \times 4 \times 3 = 6$$



4. If PM is the perpendicular from P(2, 3) onto the line x + y = 3, then the coordinates of M are **[EAMCET 2005]**

1) (2, 1) 2) (–1, 4) 3) (1, 2) 4) (4, –1)

Ans: 3

Sol. P(2, 3), $\ell = x + y = 3$, slope = - 1 by verification product of slopes = –1

from (3) option slope PM = $\frac{3-2}{2-1} = 1$

1(–1) = – 1

5. The point P is equidistant from A(1, 3), B(–3, 5) and C(5, –1). Then PA - . **[EAMCET 2003]**

1) 5 2) $5\sqrt{5}$ 3) 25 4) $5\sqrt{10}$

Ans: 4

Sol. $PA^2 = PB^2 = PC^2$

$(x-1)^2 + (y-3)^2 = (x+3)^2 + (y-5)^2$

$= (x-5)^2 + (y+1)^2$

$\Rightarrow P(x, y) = (-8, -10)$

$\therefore$ $PA = 5\sqrt{10}$

6. If (–2, 6) is the image of the point (4, 2) with respect to the line L = 0, then L = **[EAMCET 2002]**

1) $6x - 4y - 7$ 2) $2x + 3y - 5$ 3) $3x - 2y + 5$ 4) $3x - 2y + 10$

Ans: 3

Sol. L = 0 is perpendicular bisector of line segment joining the roots (–2, 6) (4, 2) L = 3x –2y+5

7. If the altitude of a triangle are in arithmetic progression, then the sides of the triangle are in .. progression **[EAMCET 2002]**

1) arithmetic 2) harmonic 3) geometric 4) arithmetico-geometric

Ans: 2

Sol. $\Delta = \frac{1}{2} P_1 a \Rightarrow P_1 = \frac{2\Delta}{a}$

$P_2 = \frac{2\Delta}{b}$ $P_3 = \frac{2\Delta}{c}$ P_1, P_2, P_3 are in A.P.

$\Rightarrow a, b, c$ are in H.P

8. The lines $2x + 3y = 6, 2x + 3y = 8$ cut the x-axis at A, B respectively. A line *l* drawn through the point (2, 2) meets the x-axis at C. In such a way that abscissae of A, B and C are in arithmetic progression. Then the equation of the line *l* is **[EAMCET 2001]**

1) $2x + 3y = 20$ 2) $3x + 2y = 10$ 3) $2x - 3y = 10$ 4) $3x - 2y = 10$

Ans: 1

Sol. The lines 2x + 3y = 6 and 2x + 3y = 8 cuts x-axis at A and B

$\therefore$ A(3, 0), B(4, 0)

The point 'C' lies on x-axis and the abscissae of the points A, B, C are in A.P.

$\therefore C(5, 0)$

$\therefore$ The equation of the line passing through (2, 2) and (5, 0) is $2x + 3y = 10$

9. The incentre of the triangle formed by the lines $x + y = 1$, $x = 1$, $y = 1$ is **[EAMCET 2001]**

1) $\left(1-\frac{1}{\sqrt{2}},1-\frac{1}{\sqrt{2}}\right)$ 2) $\left(1-\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right)$ 3) $\left(\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right)$ 4) $\left(\frac{1}{\sqrt{2}},1-\frac{1}{\sqrt{2}}\right)$

Ans: 3

Sol. The vertices of the triangle are (1, 0) (0, 1), (1, 1) and lengths of the sides are 1, 1, $\sqrt{2}$

$\therefore$ Incentre $\left(\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right)$

10. The vertices of a triangle are (6, 6), (0, 6) and (6, 0). The distance between the circumentre and centroid is **[EAMCET 2000]**

1) $2\sqrt{2}$ 2) 2 3) $\sqrt{2}$ 4) 1

Ans: 3

Sol. Circumcentre = S(3, 3)

Centroid = G(4,4) $\therefore \overrightarrow{SG} = \sqrt{2}$