CO-ORDINATES AND STRAIGHT LINE

1. If the orthocenter and centroid of a triangle are (-3, 5) and (3, 3) then its circumcentre is
(a) (6,2) (b) (3,-1)
(c) (-3,5) (d) (-3,1)

2. A (a, b), B(x_1, y_1) and C (x_2, y_2) are the vertices of a triangle. If a, x_1, x_2 are in GP with common ratio r and b, y_1, y_2 are in GP with common ratio s, then area of triangle ABC is :
(a) $ab(r-1)(s-1)(s-r)$
(b) $\frac{1}{2}ab(r+1)(s+1)(s-r)$
(c) $\frac{1}{2}ab(r-1)(s-1)(s-r)$
(d) $ab(r+1)(s+1)(r-s)$

3. The vertices of a triangle are (6, 0), (0, 6) and (6, 6). Then distance between its circumcentre and centroid, is
(a) $2\sqrt{2}$ (b) 2
(c) $\sqrt{2}$ (d) 1

4. The equation of the locus of points equidistant from (-1,-1) and (4,2) is :
(a) 3x-5y-7=0 (b) 5x+3y-9=0
(c) 4x+3y+2=0 (d) x-3y+5=0

5. If the co-ordinates of a variable point P be $\left(t+\frac{1}{t}, t-\frac{1}{t}\right)$ where t is the variable quantity, then the locus of P is :
(a) $xy=8$ (b) $2x^2-y^2=8$
(c) $x^2-y^2=4$ (d) $2x^2+3y^2=5$

6. If the co-ordinates of a variable point P be $(\cos\theta+\sin\theta, \sin\theta-\cos\theta)$, where θ is the parameter, then the locus of P is :
(a) $x^2-y^2=4$
(b) $x^2+y^2=2$
(c) $xy=3$
(d) $x^2+2y^2=3$

7. If (3,-4) and (-6,5) are the extremities of the diagonal of a parallelogram and (-2,1) is its third vertex, then its fourth vertex is:
(a) (-1,0) (b) (0,-1)
(c) (-1,1) (d) (1,1)

8. The points with the co-ordinates (2a, 3a), (3b, 2b) and (c,c) are collinear :
(a) for no value of a, b, c
(b) for all values of a, b, c
(c) $a, \frac{c}{5}, b$ are in HP
(d) *if* $a, \frac{2c}{5}$, b are in HP

9. A(-5,0) and B(3,0) are two vertices of a triangle ABC. Its area is 20 cm^2. The vertex C lies on the line x-y=2. The co-ordinates of C are :
(a) $(-3,-5)$ *or* $(-5,7)$
(b) (-7,-5) or (3,5)
(c) (7,5) or (3,5)
(d) (-3,-5) or (7,5)

10. A, B, C are respectively the points (1,2), (4,2), (4,5). *If* T_1, T_2 are the points of trisection of the line segment AC and S_1, S_2 are the points of trisection of the line segment BC, the area of the quadrilateral $T_1S_1S_2T_2$ is :
(a) 1 (b) 2
(c) $\frac{3}{2}$ (d) $\frac{5}{2}$

11. The number of integral points (integral point means both the co-ordinates should be integers) exactly in the interior of the triangle with vertices (0,0), (0,21) and (21,0) is :
(a) 133 (b) 190
(c) 233 (d) 105

12. Locus of centroid of the triangle whose vertices are (a cos t, a sint), (b sint, - b cost) and (1,0) where t is a parameter, is :

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

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

(c) $(3x+1)^2+(3y)^2=a^2+b^2$

(d) $(3x+1)^2+3y^2=a^2-b^2$

13. The equation of the straight line passing through the point (4,3) and making intercepts on the co-ordinate axes whose sum is -1 is

(a) $\frac{x}{2}+\frac{y}{3}=1 \text{ and } \frac{x}{2}+\frac{y}{1}=1$

(b) $\frac{x}{2}-\frac{y}{3}=-1 \text{ and } \frac{x}{-2}+\frac{y}{1}=1$

(c) $\frac{x}{2}+\frac{y}{3}=-1 \text{ and } \frac{x}{-2}+\frac{y}{1}=-1$

(d) $\frac{x}{2}-\frac{y}{3}=1 \text{ and } \frac{x}{-2}+\frac{y}{1}=1$

14. x-coordinates of two points B and C are the roots of equation $x^2+4x+3=0$ and their y-coordinates are the roots of equation $x^2-x-6=0$. If x-coordinate of B is less than x-coordinate of C and y-coordinate of B is greater than the y-coordinate of C and coordinates of third point A be (3,-5), then the length of the bisector of the interior angle at A is

(a) $\frac{7\sqrt{2}}{3}$ (b) $\frac{14\sqrt{2}}{3}$

(c) $\frac{5\sqrt{2}}{3}$ (d) none

15. Equation of the straight line making equal intercepts on the axes and passing through the point (2,4) is

(a) 4x-y-4=0 (b) 2x+y-8=0

(c) x+y-6=0 (d) x+2y-10=0

16. A rectangle has two opposite vertices at the points (1,2) and (5,5). If the other vertices lie on the line x = 3, then the coordinates of the other vertices are

(a) (3,-1), (3,-6) (b) (3,1), (3,5)

(c) (3,2), (3,6) (d) (3,1), (3,6)

17. A straight line passes through the point (-4,3) and the portion of the line intercepted between the axes is divided internally in the ratio 5:3 by this point. The equation of the line is

(a) 9x+20y+96=0

(b) 9x-20y+96=0

(c) 9x+20y-96=0

(d) none

18. The equation of the perpendicular bisector of the line segment joining the points (1,4) and (3,6) is

(a) x-y-7=0 (b) x+y-7=0

(c) x+y+7=0 (d) none

19. The area of the region enclosed by $4|x|+5|y| \le 20$ is

(a) 10 (b) 20

(c) 40 (d) none

20. The coordinates of the foot of the perpendicular from the point (2,4) on the line x+y =1 are

(a) $\left(\frac{1}{2},\frac{3}{2}\right)$ (b) $\left(-\frac{1}{2},\frac{3}{2}\right)$

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

21. The vertices of a triangle are (0,0), (3,0) and (0,4). Its orthocenter is at :

(a) (0,0) (b) $\left(1,\frac{4}{3}\right)$

(c) $\left(\frac{3}{2},2\right)$ (d) none

22. The orthocenter of the triangle formed by the lines x=2, y=3, and 3x+2y=6 is at the point :

(a) (2,0) (b) (0,3)

(c) (2,3) (d) none

23. The equations of the lines on which the perpendiculars from the origin make 30° angle with x-axis and which form a triangle of area $\frac{50}{\sqrt{3}}$ with axes are :

(a) $x+\sqrt{3}y\pm 10=0$

(b) $\sqrt{3}x+y\pm 10=0$

(c) $x\pm\sqrt{3}y-10=0$

(d) none

24. The number of lines that are parallel to 2x+6y-7=0 and have an intercept 10 between the co-ordinate axes is :

(a) 1 (b) 2

(c) 4 (d) infinitely many

25. If the algebraic sum of the perpendicular distances from the points (2,0), (0,2) and (1,1) to a variable straight line is zero, then the line passes through the point :

(a) (1,1) (b) (-1,1)

(c) (-1,-1) (d) (1,-1)

26. The area of the parallelogram formed by the lines 3x-4y+1=0, 3x-4y+3=0, 4x-3y-1=0 and 4x-3y-2=0, is :

(a) $\frac{1}{7}sq.units$ (b) $\frac{2}{7}sq.units$

(c) $\frac{3}{7}sq.units$ (d) $\frac{4}{7}sq.units$

27. A line passes through the point (2,2) and is perpendicular to the line 3x+y=3, then its y-intercept is :

(a) $-\frac{2}{3}$ (b) $\frac{2}{3}$

(c) $-\frac{4}{3}$ (d) $\frac{4}{3}$

28. The points on the axis of x, whose perpendicular distance from the straight line $\frac{x}{a}+\frac{y}{b}=1$ is a :

(a) $\frac{b}{a}\left(a\pm\sqrt{\left(a^2+b^2\right)},0\right)$

(b) $\frac{a}{b}\left(b\pm\sqrt{\left(a^2+b^2\right)},0\right)$

(c) $\frac{b}{a}\left(a+b,0\right)$

(d) $\frac{a}{b}\left(a\pm\sqrt{\left(a^2+b^2\right)},0\right)$

29. IF (-2,6) is the image of the point (4,2) with respect to the line L = 0, then L =

(a) 6x-4y-7=0 (b) 2x-3y-5=0

(c) 3x-2y+5=0 (d) 3x-2y+0=0

30. The locus of the point of intersection of lines $x\cos\alpha+y\sin\alpha=a$ and $x\sin\alpha - y\cos\alpha = b$ (α is a parameter) is :

(a) $2\left(x^2+y^2\right)=a^2+b^2$

(b) $x^2-y^2=a^2-b^2$

(c) $x^2+y^2=a^2+b^2$

(d) $x^2-y^2=a^2+b^2$

31. If the lines x+2ay+a=0, x+3by+b=0 and x+4cy+c=0 is concurrent, then a, b, c, are in ;

(a) AP (b) GP

(c) HP (d) AGP

32. A ray of light passing through the point (1,2) is reflected on the x-axis at a point P and passes through the Point (5,3). The abscissa of the point P is :

(a) 3 (b) $\frac{13}{3}$

(c) $\frac{13}{5}$ (d) $\frac{13}{4}$

33. A ray of light coming along the line 3x+4y-5=0 gets reflected from the line ax+by-1=0 and goes along the line 5x-12y-10=0 then

(a) $a=\frac{64}{115}, b=\frac{112}{15}$

(b) $a=-\frac{64}{115}, b=\frac{8}{115}$

(c) $a=\frac{64}{115}, b=\frac{8}{115}$

(d) $a=-\frac{64}{115}, b=\frac{-8}{115}$

34. Two sides of an isosceles triangle are given by the equations 7x-y+3=0 and x+y-3=0. If its third side passes through the point (1,-10), then its equations are :

(a) x-3y-7=0 or 3x+y-33=0
(b) x-3y-31=0 or 3x+y-7=0
(c) x-3y-31=0 or 3x+y+7=0
(d) none

35. If a line going two points A(2,0) and B(3,1) is rotated about A in the anticlockwise direction through an angle 15°, then equation of the line in the new position is :

(a) $\sqrt{3}x-y=2\sqrt{3}$ (b) $\sqrt{3}x+y=2\sqrt{3}$

(c) $x+\sqrt{3}y=2\sqrt{3}$ (d) none

36. The equation x+2y=3 represents the side BC of ΔABC; where co-ordinates of A are (1,2). If the x-co-ordinate of the orthocenter of ΔABC is 3 then the y-co-ordinates of the orthocenter is :

(a) 4 (b) 6
(c) 8 (d) 10

37. The straight lines $x+y-4=0$, $3x+y=4$ and $x+3y-4=0$ form a triangle which is

(a) isosceles (b) right-angled
(c) equilateral (d) None of tehse

38. The equation of the diagonal through origin of the quadrilateral formed by $x=0, y=0, x+y-1=0$ and 6x + y – 3 = 0 is

(a) $4x-3y=0$ (b) $3x-2y=0$
(c) $x=y$ (d) x + y = 0

39. The equation $ax^2+by^2+cx+cy=0$, c ≠ 0, represents a pair of straight lines if

(a) a + b = 0 (b) a + c = 0
(c) b + c = 0 (d) none of these

40. A diagonal of the rectangle formed by the lines $x^2-7x+6=0$ and $y^2-14y+40=0$ is

(a) 5x + 6y = 0
(b) 5x – 6y = 0
(c) 6x – 5y + 14 = 0
(d) 6x – 5y – 14 = 0

41. The pair of straight lines perpendicular to the pair of lines $ax^2+2hxy+by^2=0$ has the equation

(a) $ax^2-2hxy+by^2=0$
(b) $ay^2+2hxy+bx^2=0$
(c) $bx^2+2hxy+ay^2=0$
(d) $bx^2-2hxy+ay^2=0$

42. The angle between the lines $2x^2-7xy+3y^2=0$ is

(a) 60° (b) 45°
(c) $\tan^{-1}\left(\frac{7}{6}\right)$ (d) 30°

43. The line x = y = 4 divides the line joining (-1, 1) and (5, 7) in the ratio λ : 1, then the value of λ is

(a) 2
(b) 1/2
(b) 3
(d) none of these

44. Points (1, 2) and (-2, 1) are

(a) on the same side of the line 4x+2y = 1

(b) on the line 4x + 2y = 1

(c) on the opposite side of 4x + 2y = 1

(d) none of these

45. The equation $4x^2 + mxy - 3y^2 = 0$ represents a pair of real and distinct lines if

(a) $m \in R$ (b) $m \in (3, 4)$

(c) $m \in (-3, 4)$ (d) $m > 4$

46. The point (4, 1) undergoes the following three transformations successively.

I. Reflection about the line y = x

II. Transformation through a distance 2 units along the positive direction of x-axis.

III. Rotation through an angle π/4 about the origin in the anticlockwise direction.

The final position of the point is given by the coordinates

(a) $\left(\frac{1}{\sqrt{2}}, \frac{7}{\sqrt{2}}\right)$ (b) $(-2, 7\sqrt{2})$

(c) $\left(-\frac{1}{\sqrt{2}}, \frac{7}{\sqrt{2}}\right)$ (d) $(\sqrt{2}, 7\sqrt{2})$

47. Let PQR be a right-angled triangle, right angled at P(2, 1). If the equation of the line QR is 2x + y = 3 and Q = (2, - 1), then the centroid of the ΔPQR is

(a) $\left(\frac{5}{3}, \frac{1}{3}\right)$ (b) $\left(2, \frac{1}{3}\right)$

(c) (2, 0) (d) $\left(\frac{1}{3}, \frac{5}{3}\right)$

48. The distance between the parallel lines $9x^2 - 6xy + y^2 + 18x - 6y + 8 = 0$ is

(a) $\frac{1}{\sqrt{10}}$ (b) $\frac{2}{\sqrt{10}}$

(c) $\frac{4}{\sqrt{10}}$ (d) $\sqrt{10}$

49. If the sum of the slopes of the lines given by $x^2 - 2cxy - 7y^2 = 0$ is four times their product then c has the value

(a) 1 (b) - 2

(c) 2 (d) - 1

50. If a vertex of triangle is (1, 1) and the mid-points of two sides through this vertex are (-1, 2) and (3, 2), then the centroid of the triangle is

(a) $\left(1, \frac{7}{3}\right)$ (b) $\left(\frac{1}{3}, \frac{7}{3}\right)$

(c) $\left(-1, \frac{7}{3}\right)$ (d) $\left(-\frac{1}{3}, \frac{7}{3}\right)$

ANSWERS

1. (a)	2.(c)	3.(c)	4.(b)	5.(c)	6.(b)	7.(a)	8.(d)	9.(d)	10(c)
11.(b)	12.(b)	13.(d)	14.(b)	15.(c)	16.(d)	17.(b)	18.(b)	19.(c)	20(b)
21.(a)	22.(c)	23.(b)	24.(b)	25.(a)	26.(b)	27.(c)	28.(b)	29.(c)	30.(c)
31.(c)	32.(c)	33.(c)	34.(c)	35.(a)	36.(b)	37.(a)	38.(b)	39.(a)	40.(c)
41.(d)	42.(b)	43.(b)	44.(c)	45.(a)	46.(c)	47.(a)	48.(b)	49.(c)	50.(a)