Straight Line 1

1. The equation of the straight line which passes through the point (1, - 2) and cuts off equal intercepts from axes, is
(A) $x + y = 1$ (B) $x - y = 1$
(C) $x + y + 1 = 0$ (D) $x - y - 2 = 0$

2. A line L is perpendicular to the line $5x - y = 1$ and the area of the triangle formed by the line L and coordinate axes is 5 . The equation of the line L is :
(A) $x + 5y = 5$ (B) $x + 5y = \pm 5\sqrt{2}$
(C) $x - 5y = 5$ (D) $x - 5y = 5\sqrt{2}$

3. In the equation, $y - y_1 = m(x - x_1)$ if m & x_1 are fixed & different lines are drawn for different values of y_1, then
(A) The lines will pass through a single point
(B) There will be a set of parallel lines
(C) There will be one line only
(D) None of these

4. For the straight lines given by the equation, $(2 + k)x + (1 + k)y = 5 + 7k$, for different values of k, which of the following statements is true ?
(A) Lines are parallel
(B) Lines pass through the point (- 2, 9)
(C) Lines pass through the point (2, - 9)
(D) None of these

5. Orthocentre of the triangle whose vertices are (0, 0), (2, - 1) & (1, 3) is
(A) $\left(\frac{4}{7}, \frac{1}{7}\right)$ (B) $\left(-\frac{4}{7}, -\frac{1}{7}\right)$
(C) (- 4, - 1) (D) (4, 1)

6. If the lines, $ax + by + c = 0$, $bx + cy + a = 0$ and $cx + ay + b = 0$ be concurrent, then :
(A) $a^3 + b^3 + c^3 + 3abc = 0$
(B) $a^3 + b^3 + c^3 - abc = 0$
(C) $a^3 + b^3 + c^3 - 3abc = 0$
(D) None of these

7. The line joining two point A (2, 0), B (3, 1) is rotated about A in anti clockwise direction through an angle of 15º . The equation of the line in the new position is :
(A) $\sqrt{3}x - y - 2\sqrt{3} = 0$
(B) $x - \sqrt{3}y - 2 = 0$
(C) $\sqrt{3}x + y - 2\sqrt{3} = 0$
(D) $x + \sqrt{3}y - 2 = 0$

8. The equation of the base of an equilateral triangle is $x + y = 2$ and the vertex is (2, - 1) . The length of the side of the triangle is :
(A) $\sqrt{\frac{3}{2}}$ (B) $\sqrt{2}$
(C) $\sqrt{\frac{2}{3}}$ (D) None of these

9. A point moves so that square of its distance from the point (3, - 2) is numerically equal to its distance from the line $5x - 12y = 13$. The equation of the locus of the point is :
(A) $13x^2 + 13y^2 - 83x + 64y + 182 = 0$
(B) $x^2 + y^2 - 11x + 16y + 26 = 0$
(C) $x^2 + y^2 - 11x + 16y = 0$
(D) None of these

10. The equation of the lines which passes through the point $(3, -2)$ & are inclined at 60° to the line $\sqrt{3}\,x + y = 1$

(A) $y + 2 = 0,\ \sqrt{3}\,x - y - 2 - 3\sqrt{3} = 0$

(B) $x - 2 = 0,\ \sqrt{3}\,x - y + 2 + 3\sqrt{3} = 0$

(C) $\sqrt{3}\,x - y - 2 - 3\sqrt{3} = 0$

(D) None of these

11. The points on the line, $x + y = 4$ which lie at a unit distance from the line, $4x + 3y = 10$, are :

(A) $(3, 1), (-7, 11)$

(B) $(3, 1), (7, 11)$

(C) $(-3, 1), (-7, 11)$

(D) $(1, 3), (-7, 11)$

12. The equation of the bisector of the acute angle between the lines, $3x - 4y + 7 = 0$ and $12x + 5y - 2 = 0$ is

(A) $21x + 77y - 101 = 0$

(B) $11x - 3y + 9 = 0$

(C) $31x + 77y + 101 = 0$

(D) $11x - 3y - 9 = 0$

13. If the lines $y = 3x + 1$ & $2y = x + 3$ are equally inclined to the line, $y = mx + 4$ then $m =$

(A) $\frac{1 + 3\sqrt{2}}{7}$ (B) $\frac{1 - 3\sqrt{2}}{7}$

(C) $\frac{1 \pm 3\sqrt{2}}{7}$ (D) $\frac{1 \pm 5\sqrt{2}}{7}$

14. If the slope of a line passing through the point $A(3, 2)$ be $\frac{3}{4}$, then the points on the line which are 5 units away from A, are :

(A) $(5, 5)\ (-1, -1)$ (B) $(7, 5)\ (-1, -1)$

(C) $(5, 7)\ (-1, -1)$ (D) $(7, 5)\ (1, 1)$

15. The lines $ax + by + c = 0$, where $3a + 2b + 4c = 0$ are concurrent at the point :

(A) $\left(\frac{1}{2}, \frac{3}{4}\right)$ (B) $(1, 3)$

(C) $(3, 1)$ (D) $\left(\frac{3}{4}, \frac{1}{2}\right)$

16. The equations of two equal sides of an isosceles triangle are $7x - y + 3 = 0$ and $x + y - 3 = 0$ and the third side passes through the point $(1, -10)$. The equation of the third side is :

(A) $x - 3y - 31 = 0$ but not $3x + y + 7 = 0$

(B) $3x + y + 7 = 0$ but not $x - 3y - 31 = 0$

(C) $3x + y + 7 = 0$ or $x - 3y - 31 = 0$

(D) Neither $3x + y + 7$ nor $x - 3y - 31 = 0$

17. The value of k for which the lines, $7x - 8y + 5 = 0$, $3x - 4y + 5 = 0$ and $4x + 5y + k = 0$ are concurrent is given by :

(A) -45 (B) 44

(C) 54 (D) -54

18. The co-ordinates of the foot of the perpendicular from the point $(2, 3)$ on the line $y = 3x + 4$ are given by :

(A) $\left(\frac{37}{10}, -\frac{1}{10}\right)$ (B) $\left(-\frac{1}{10}, \frac{37}{10}\right)$

(C) $\left(\frac{10}{37}, -10\right)$ (D) $\left(\frac{2}{3}, -\frac{1}{3}\right)$

19. If the co-ordinates of the middle point of the portion of a line intercepted between co-ordinate axes $(3, 2)$, then

the equation of the line will be :
(A) $2x + 3y = 12$ (B) $3x + 2y = 12$
(C) $4x - 3y = 6$ (D) $5x - 2y = 10$

20. For what values of a & b the intercepts cut off on the co-ordinate axes by the line, $ax + by + 8 = 0$ are equal in length but opposite in signs to those cut off by the line, $2x - 3y + 6 = 0$ on the axes

(A) $a = \frac{8}{3}, b = -4$

(B) $a = -\frac{8}{3}, b = -4$

(C) $a = \frac{8}{3}, b = 4$

(D) $a = -\frac{8}{3}, b = 4$

21. The point (4, 1) undergoes the following two successive transformations,
(i) Reflection about the line $y = x$
(ii) Translation through a distance 2 units along the positive x-axis
Then the final co-ordinates of the point are :
(A) (4, 3) (B) (3, 4)
(C) (1, 4) (D) $\left(\frac{7}{2}, \frac{7}{2}\right)$

22. The equation of straight line passing through $(-a, 0)$ & making the triangle with axes of area 'T' is :
(A) $2Tx + a^2y + 2aT = 0$
(B) $2Tx - a^2y + 2aT = 0$
(C) $2Tx - a^2y - 2aT = 0$
(D) None of these

23. A variable line passes through a fixed point P . The algebraic sum of the perpendiculars drawn from (2, 0), (0, 2) and (1, 1) on the line is zero, then the co-ordinates of the P are :
(A) (1, - 1) (B) (1, 1)
(C) (2, 1) (D) (2, 2)

24. The area of a parallelogram formed by the lines, $ax \pm by \pm c = 0$

(A) $\frac{c^2}{ab}$ (B) $\frac{2c^2}{ab}$

(C) $\frac{c^2}{2ab}$ (D) None of these

25. If a & b are two arbitrary constants, then the straight line, $(a - 2b)x + (a + 3b)y + 3a + 4b = 0$, will pass through :
(A) (- 1, - 2) (B) (1, 2)
(C) (- 2, - 3) (D) (2, 3)

26. The vertices of a Δ OBC are (0, 0), $(-3, -1)$ and $(-1, -3)$ respectively . Then the equation of line parallel to BC which is at $\frac{1}{2}$ unit distant from origin and cuts OB and OC, is :

(A) $2x + 2y + \sqrt{2} = 0$

(B) $2x + 2y - \sqrt{2} = 0$

(C) $2x - 2y + \sqrt{2} = 0$

(D) None of these

27. A vertex of equilateral triangle is (2, 3) and equation of opposite side is $x + y = 2$, then the equation of one side from rest two, is :
(A) $x - 3 = 2(x - 2)$

(B) $y - 3 = \left(2 - \sqrt{3}\right)(x - 2)$

(C) $y - 3 = \left(\sqrt{3} - 1\right)(x - 2)$

(D) None of these

28. The incentre of triangle formed by the lines, $x = 0$, $y = 0$ & $3x + 4y = 12$ is

(A) $\left(\frac{1}{2}, \frac{1}{2}\right)$ (B) $(1, 1)$

(C) $\left(1, \frac{1}{2}\right)$ (D) $\left(\frac{11}{2}, 1\right)$

29. The equation of line whose mid point is (x_1, y_1) in between the axes, is :

(A) $\frac{x}{x_1} + \frac{y}{y_1} = 2$ (B) $\frac{x}{x_1} + \frac{y}{y_1} = \frac{1}{2}$

(C) $\frac{x}{x_1} + \frac{y}{y_1} = 1$ (D) None of these

30. The area of triangle formed by the lines, $x = 0$, $y = 0$ & $\frac{x}{a} + \frac{y}{b} = 1$, is

(A) ab (B) $\frac{ab}{2}$

(C) $2ab$ (D) $\frac{ab}{3}$

31. A line, L passes through the point $(1, 1)$ & $(2, 0)$ & another line L′ passes through $\left(\frac{1}{2}, 0\right)$ & perpendicular to L.

Then the area of the triangle formed by the lines L, L′ and y-axis, is :

(A) $\frac{15}{8}$ (B) $\frac{25}{4}$

(C) $\frac{25}{8}$ (D) $\frac{25}{16}$

32. The orthocentre of the triangle formed by the lines, $4x - 7y + 10 = 0$, $x + y = 5$ and $7x + 4y = 15$, is :

(A) $(1, 2)$ (B) $(1, -2)$

(C) $(-1, -2)$ (D) $(-1, 2)$

33. Equation of a straight line on which length of perpendicular from the origin is four units and the line makes an angle of 120° with the x-axis is :

(A) $x\sqrt{3} + y + 8 = 0$

(B) $x\sqrt{3} - y = 8$ (C) $x\sqrt{3} + y = 8$

(D) $x - \sqrt{3}y + 8 = 0$

34. In what direction a line be drawn through the point $(1, 2)$ so that its point of intersection with the line, $x + y = 4$ is at a distance $\frac{\sqrt{6}}{3}$ from the given point .

(A) 30° (B) 45°

(C) 60° (D) 75°

35. Equation of one of the sides of an isosceles right angled triangle whose hypotenuse is, $3x + 4y = 4$ and the opposite vertex of the hypotenuse is $(2, 2)$ will be :

(A) $x - 7y + 12 = 0$

(B) $7x + y - 12 = 0$

(C) $x - 7y + 16 = 0$

(D) $7x + y + 16 = 0$

36. Locus of the points which are at equal distance from $3x + 4y - 11 = 0$ and $12x + 5y + 2 = 0$ and which is near the origin is :

(A) $21x - 77y + 153 = 0$
(B) $99x + 77y - 133 = 0$
(C) $7x - 11y = 19$
(D) None of these

37. Co-ordinates of the orthocentre of the triangle whose sides are $x = 3$, $y = 4$ and $3x + 4y = 6$, will be :
(A) (0, 0) (B) (3, 0)
(C) (0, 4) (D) (3, 4)

38. Two vertices of a triangle are $(5, -1)$ and $(-2, 3)$. If orthocentre is the origin then co-ordinates of the third vertex are :
(A) (7, 4) (B) (-4, 7)
(C) (4, -7) (D) (-4, -7)

39. The orthocentre of the triangle formed by the lines $x + y = 1$, $2x + 3y = 6$ and $4x - y + 4 = 0$ lies in quadrant .
(A) First (B) Second
(C) Third (D) Fourth

40. The straight line passing through the point of intersection of the straight line $x - 3y + 1 = 0$ and $2x + 5y - 9 = 0$ and having infinite slope and at a distance of 2 units from the origin, has the equation,
(A) $x = 2$ (B) $3x + y - 1 = 0$
(C) $y = 1$ (D) None of these

41. The straight line passes through the point of intersection of the straight lines $x + 2y - 10 = 0$ & $2x + y + 5 = 0$ is
(A) $5x - 4y = 0$ (B) $5x + 4y = 0$
(C) $4x - 5y = 0$ (D) $4x + 5y = 0$

42. A straight line moves so that the sum of the reciprocals of its intercepts on two perpendicular lines is constant, then the line passes through :
(A) A fixed point (B) A variable point
(C) Origin (D) None of these

43. The equation to the straight line passing through the point, $(a\cos^3\theta, a\sin^3\theta)$ and perpendicular to the line $x\sec\theta + y\,\text{cosec}\,\theta = a$, is :
(A) $x\cos\theta - y\sin\theta = a\cos 2\theta$
(B) $x\cos\theta + y\sin\theta = a\cos 2\theta$
(C) $x\sin\theta + y\cos\theta = a\cos 2\theta$
(D) None of these

44. Equation of the right bisector of the line segment joining the points (7, 4) and (-1, -2) is :
(A) $4x - 3y = 15$ (B) $3x + 4y = 15$
(C) $4x + 3y = 15$ (D) None of these

45. If the straight line through the point P (3, 4) makes an $\angle \frac{\pi}{6}$ with the x-axis & meets the line, $12x + 5y + 10 = 0$ at Q, then the length PQ is :

(A) $\frac{132}{12\sqrt{3} + 5}$ (B) $\frac{132}{12\sqrt{3} - 5}$

(C) $\frac{132}{5\sqrt{3} + 12}$ (D) $\frac{132}{5\sqrt{3} - 12}$

46. The line $2x + 3y = 12$ meets the x-axis at A and y-axis at B . The line through (5, 5) perpendicular to AB meets the x-axis, y-axis and the AB at C, D and E respectively . If O is the origin of co-ordinates, then the area of OCEB is :

(A) 23 sq. units (B) $\frac{23}{2}$ sq. units

(C) $\frac{23}{3}$ sq. units (D) None of these

47. The equation of perpendicular bisectors of the sides AB and AC of a triangle ABC are $x - y + 5 = 0$ and $x + 2y = 0$ respectively . If the point A is (1, - 2), then equation of line BC is
(A) $23x + 14y - 40 = 0$
(B) $14x - 23y + 40 = 0$
(C) $23x - 14y + 40 = 0$
(D) $14x + 23y - 40 = 0$

48. Equation of the two straight lines passing through the point (3, 2) and making an angle of 45° with the line $x - 2y = 3$, are :
(A) $3x + y + 7 = 0$ & $x + 3y + 9 = 0$
(B) $3x - y - 7 = 0$ & $x + 3y - 9 = 0$
(C) $x + 3y - 7 = 0$ & $x + 3y - 9 = 0$

49. A line $4x + y = 1$ passes through the point A (2, - 7) meets the line BC whose equation is $3x - 4y + 1 = 0$ at the point B . The equation to the line AC so that AB = AC is :
(A) $52x + 89y + 519 = 0$
(B) $52x + 89y - 519 = 0$
(C) $89x + 52y + 519 = 0$
(D) $89x + 52y - 519 = 0$

50. The opposite angular points of a square are (3, 4) & (1, − 1) . Then the co-ordinates of other two vertices are
(A) D $\left(\frac{1}{2}, \frac{9}{2}\right)$, B $\left(-\frac{1}{2}, \frac{5}{2}\right)$
(B) D $\left(-\frac{1}{2}, \frac{9}{2}\right)$, B $\left(\frac{1}{2}, \frac{5}{2}\right)$
(C) D $\left(\frac{9}{2}, \frac{1}{2}\right)$, B $\left(-\frac{1}{2}, \frac{5}{2}\right)$
(D) None of these

51. One side of a rectangle lies along the line $4x + 7y + 5 = 0$. Two of its vertices are (- 3, 1) and (1, 1) . Then the equations of other sides are :
(A) $7x - 4y + 25 = 0$, $4x + 7y = 11$ and $7x - 4y - 3 = 0$
(B) $7x + 4y + 25 = 0$, $7y + 4x - 11 = 0$ and $7x - 4y - 3 = 0$
(C) $4x - 7y + 25 = 0$, $7x + 4y - 11 = 0$ and $4x - 7y - 3 = 0$
(D) None of these

52. Two consecutive sides of a parallelogram are, $4x + 5y = 0$ and $7x + 2y = 0$. If the equation to one diagonal is $11x + 7y = 9$, then the equation of the other diagonal is :
(A) $x + 2y = 0$ (B) $2x + y = 0$
(C) $x - y = 0$ (D) None of these

53. Equations of lines which passes through the points of intersection of the lines $4x - 3y - 1 = 0$ and $2x - 5y + 3 = 0$ & are equally inclined to the axes are :
(A) $y \pm x = 0$ (B) $y - 1 = \pm 1 (x - 1)$
(C) $x - 1 = \pm 2 (y - 1)$
(D) None of these

54. The equations of two lines through (0, a) which are at a distance 'a' from the point (2a, 3a) are :
(A) $y - a = 0$ and $4x - 3y - 3a = 0$
(B) $y - a = 0$ and $3x - 4y + 3a = 0$
(C) $y - a = 0$ and $4x - 3y + 3a = 0$
(D) None of these

55. The vertices of a triangle are, $[at_1t_2, a(t_1 + t_2)]$, $[at_2t_3, a(t_2 + t_3)]$ and $[at_3t_1, a(t_3 + t_1)]$, then the co-ordinates of the orthocentre are :
(A) $[a, a(t_1 + t_2 + t_3 + t_1t_2t_3)]$

(B) $[-a, a(t_1 + t_2 + t_3 + t_1t_2t_3)]$
(C) $[-a, a(t_1 + t_2 + t_3 + t_1t_2t_3), a]$
(D) None of these

56. Equation of the line which passes through the point (- 4, 3) and the portion of the line intercepted between the axes is divided internally in the ration 5 : 3 by this point, is :
(A) $9x + 20y + 96 = 0$
(B) $20x + 9y + 96 = 0$
(C) $9x - 20y + 96 = 0$
(D) None of these

57. The equations of the lines through the point of intersection of the lines, $x - y + 1 = 0$ & $2x - 3y + 5 = 0$ & whose distance from the point (3, 2) is $\frac{7}{5}$, is
(A) $3x - 4y - 6 = 0$ & $4x + 3y + 1 = 0$
(B) $3x - 4y + 6 = 0$ & $4x - 3y - 1 = 0$
(C) $3x - 4y + 6 = 0$ & $4x - 3y + 1 = 0$
(D) None of these

58. A point moves such that its distance from the point (4, 0) is half that of its distance from the line $x = 16$. The locus of this point is :
(A) $3x^2 + 4y^2 = 192$
(B) $4x^2 + 3y^2 = 192$
(C) $x^2 + y^2 = 192$ (D) None of these

59. If the sum of the distances of a point from perpendicuar lines in a plane is 1, then its locus is :
(A) Square (B) Circle
(C) Straight line
(D) Two intersecting lines

60. Given vertices A (1, 1), B (4, - 2) and C (5, 5) of a triangle, then the equation of the perpendicular dropped from C to the interior bisector of the $\angle$ A is
(A) $y - 5 = 0$ (B) $x - 5 = 0$
(C) $y + 5 = 0$ (D) $x + 5 = 0$

61. The reflection of the point (4, - 13) in the line $5x + y + 6 = 0$, is :
(A) (- 1, - 14) (B) (3, 4)
(C) (1, 2) (D) (- 4, 13)

62. The diagonals of the parallelogram whose sides are $lx + my + n = 0$, $lx + my + n' = 0$, $mx + ly + n = 0$, $mx + ly + n' = 0$ include an angle :
(A) $\frac{\pi}{3}$ (B) $\frac{\pi}{2}$
(C) $\tan^{-1}\left(\frac{\ell^2 - m^2}{\ell^2 + m^2}\right)$
(D) $\tan^{-1}\left(\frac{2\ell m}{\ell^2 + m^2}\right)$

63. A pair of straight lines drawn through the origin form with the line, $2x + 3y = 6$ an isosceles right angled triangle, then the lines and the area of the triangle thus formed is :
(A) $x - 5y = 0$, $5x + y = 0$; $\Delta = \frac{36}{13}$ (B) $3x - y = 0$, $x + 3y = 0$; $\Delta =$
(C) $5x - y = 0$, $x + 5y = 0$; $\Delta =$ (D) None of these

64 A line through A (- 5, - 4) meets the lines $x + 3y + 2 = 0$, $2x + y + 4 = 0$ & $x - y - 5 = 0$ at B, C & D respectively. If $\left(\frac{15}{AB}\right)^2 + \left(\frac{10}{AC}\right)^2 = \left(\frac{6}{AD}\right)^2$, then

the equation of the line is :
(A) $2x + 3y + 22 = 0$
(B) $5x - 4y + 7 = 0$
(C) $3x - 2y + 3 = 0$
(D) None of these

65. The vertices of a Δ ABC are (0, 0), (2, - 1) and (9, 2) respectively, then cos B =

(A) $\frac{11}{290}$ (B) $\frac{\sqrt{11}}{290}$

(C) $-\frac{11}{\sqrt{290}}$ (D) $-\sqrt{\frac{11}{290}}$

ANSWERS

1. C	2. B	3. B	4. B	5. B	6. C
7. A	8. C	9. A	10. A	11. A	12.B
13. D	14. B	15. D	16. C	17. A	18.B
19. A	20. D	21. B	22. B	23. B	24.B
25. A	26. A	27. B	28. B	29. A	30.B
31. D	32. A	33. A	34. D	35. A	36.B
37. D	38. D	39. A	40. A	41. B	42.A
43. A	44. C	45. A	46. C	47. D	48.B
49. A	50. C	51. A	52. C	53. B	54.C
55. B	56. C	57. C	58. A	59. A	60.B
61. A	62. B	63. A	64. A	65. C	