MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

STRAIGHT LINES

Exercise 10 1

1. Draw a quadrilateral in the Cartesian plane, whose vertices are $(-4, 5), (0, 7), (5, -5)$ and $(-4, -2)$. Also, find its area.

▶ **Watch Video Solution**

2. The base of an equilateral triangle with side 2a lies along the Y-axis such that the mid-point of the base is at the origin. Find vertices of the

triangle.

3. Find the distance between $P(x_1, y_1)$ and $Q(x_2, y_2)$ when (i) PQ is parallel to the Y-axis (ii) PQ is parallel to the X- axis.

4. Find a point on the X-axis, which is equidistant from the points $(7, 6)$ and $(-3, 4)$.

5. Find the slope of a line, which passes through the origin, and the mid-point of the line segment joining the points $P(0, -4)$ and $B(8, 0)$.

6. Without using the Pythagoras theorem, show that the points $(4, 4), (3, 5)$ and $(-1, -1)$ are the vertices of a right angled triangle.

▶ Watch Video Solution

7. Find the slope of the line, which makes an angle of 30° with the positive direction of Y -axis measured anticlockwise.

▶ Watch Video Solution

8. Find the value of x for which the points $(x, -1), (2, 1)$ and $(4, 5)$ are collinear.

▶ Watch Video Solution

9. Without using distance formula, show that points $(-2, -1), (4, 0), (3, 3)$ and $(-3, 2)$ are the vertices of a

parallelogram.

10. Find the angle between the X-axis and the line joining the points $(3, -1)$ and $(4, -2)$.

11. The slope of a line is double of the slope of another line. If tangent of the angle between them is $\frac{1}{3}$, find the slopes of the lines.

12. A line passes thorough (x_1, y_1) and (h, k). If slope of the line is m, show that, $k - y_1 = m(h - x_1)$.

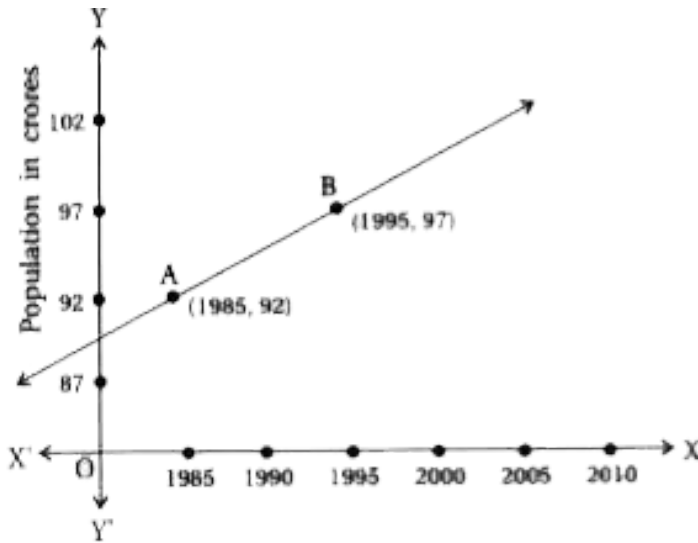**13.** If three points $(h, 0)$, (a, b) and $(0, k)$ lie on a line, show that $\dfrac{a}{h} + \dfrac{b}{k} = 1$.

14. Consider the following population and year graph, find the slope of the line AB and using it, find what will be the population in the year 2010?

Exercise 10 2

1. Obtain Equation of line which satisfy given condition :

Write the equations for the X- and Y- axes.

2. Obtain Equation of line which satisfy given condition :

Passing through the point $(-4, 3)$ with slope $\dfrac{1}{2}$.

3. Obtain Equation of line which satisfy given condition :

Passing through $(0, 0)$ with slope m.

4. Obtain Equation of line which satisfy given condition :

Passing through $(2, 2\sqrt{3})$ and inclined with the X-axis at an angle of 75º.

5. Obtain Equation of line which satisfy given condition :

Intersecting the X -axis at a distance of 3 units to the left of origin with slope -2.

6. Obtain Equation of line which satisfy given condition :

Intersecting the Y -axis at a distance of 2 units above the origin and making an angle of 30º with positive direction of the X -axis.

7. Obtain Equation of line which satisfy given condition :

Passing through the points $(-1, 1)$ and $(2, -4)$.

8. Obtain Equation of line which satisfy given condition :

Perpendicular distance from the origin is 5 units and the angle made by the perpendicular with the positive X -axis is 30º.

9. The vertices of ΔPQR are $P(2, 1), Q(-2, 3)$ and $R(4, 5)$. Find equation of the median through the vertex R.

10. Find the equation of the line passing through $(-3, 5)$ and perpendicular to the line through the points $(2, 5)$ and $(-3, 6)$.

11. A line perpendicular to the line segment joining the points $(1, 0)$ and $(2, 3)$ divides it in the ratio $1 : n$. Find the equation of the line.

12. Find the equation of a line that cuts off equal intercepts on the coordinate axes and passes through the point $(2, 3)$.

13. Find equation of the line passing through the point $(2, 2)$ and cutting off intercepts on the axes whose sum is 9.

14. Find equation of the line through the point $(0, 2)$ making an angle $\dfrac{2\pi}{3}$ with the positive X -axis. Also, find the equation of line parallel to it

and crossing the Y -axis at a distance of 2 units below the origin.

15. The perpendicular from the origin to a line meets it at the point $(-2, 9)$, find the equation of the line.

16. The length L (in centimetre) of a copper rod is a linear function of its Celsius temperature C. In an experiment, if $L = 124.942$ when $C = 20$ and $L = 125.134$ when $C = 110$, express L in terms of C.

17. The owner of a milk store finds that, he can sell 980 litres of milk each week at Rs. 14/litre and 1220 litres of milk each week at Rs. 16/litre.

Assuming a linear relationship between selling price and demand, how many litres could he sell weekly at Rs. 17/litre ?

> ▶ Watch Video Solution

18. P (a, b) is the mid-point of a line segment between axes. Show that equation of the line is $\dfrac{x}{a} + \dfrac{y}{b} = 2$.

> ▶ Watch Video Solution

19. Point $R(h, k)$ divides a line segment between the axes in the ratio $1:2$. Find equation of the line.

> ▶ Watch Video Solution

20. By using the concept of equation of a line, prove that the three points $(3, 0), (-2, -2)$ and $(8, 2)$ are collinear.

> ▶ Watch Video Solution

1. Reduce the following equations into slope intercept form and find their slopes and the y- intercepts.

(i) $x + 7y = 0$

▶ Watch Video Solution

2. Reduce the following equations into slope intercept form and find their slopes and the y- intercepts.

(ii) $6x + 3y - 5 = 0$

▶ Watch Video Solution

3. Reduce the following equations into slope intercept form and find their slopes and the y- intercepts.

(iii) $y = 0$

4. Reduce the following equations in intercept form and find their intercepts on axis.

(i) $3x + 2y - 12 = 0$

5. Reduce the following equations in intercept form and find their intercepts on axis.

(ii) $4x - 3y = 6$

6. Reduce the following equations in intercept form and find their intercepts on axis.

(iii) $3y + 2 = 0$

7. Reduce the following equation in normal form. Find their perpendicular distances from origin and between perpendicular distance with positive side of X- axis :

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

8. Reduce the following equation in normal form. Find their perpendicular distances from origin and between perpendicular distance with positive side of X- axis :

(ii) $y - 2 = 0$

9. Reduce the following equation in normal form. Find their perpendicular distances from origin and between perpendicular distance with positive

side of X- axis :

(iii) $x - y = 4$

10. Find the distance of the point $(-1, 1)$ from the line $12(x + 6) = 5(y - 2)$.

11. Find the points on the X-axis, whose distances from the line $\frac{x}{3} + \frac{y}{5} = 1$ are 4 units.

12. Find the distance between following pair of parallel lines :

(i) $15x + 8y - 34 = 0$ and $15x + 8y + 31 = 0$

13. Find the distance between following pair of parallel lines :

(ii) $l(x + y) + p = 0$ and $l(x + y) - r = 0$

▶ Watch Video Solution

14. Find equation of the line parallel to the line $3x - 4y + 2 = 0$ and passing through the point $(-2, 3)$.

▶ Watch Video Solution

15. Find equation of the line perpendicular to the line $x - 7y + 5 = 0$ and having x intercept 3.

▶ Watch Video Solution

16. Find angles between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

17. The line through the points $(h, 3)$ and $(4, 1)$ intersects the line $7x - 9y - 17 = 0$ at right angle. Find the value of h.

18. Prove that the line through the point (x_1, y_1) and parallel to the line $Ax + By + C = 0$ is $A(x - x_1) + B(y - y_1) = 0$.

19. Two lines passing through the point $(2, 3)$ intersects each other at an angle of $60º$. If slope of one line is 2, find equation of the other line.

20. Find the equation of the right bisector of the line segment joining the points $(3, 4)$ and $(-1, 2)$.

21. Find the coordinates of the foot of perpendicular from the point $(-1, 3)$ to the line $3x - 4y - 16 = 0$.

22. The perpendicular from the origin to the line $y = mx + c$ meets it at the point $(-1, 2)$. Find the values of m and c.

23. If p and q are the lengths of perpendiculars from the origin to the lines $x \cos \theta - y \sin \theta = k \cos 2\theta$ and $x \sec \theta + y \cos ec\theta = k$

respectively, prove that $p^2 + 4q^2 = k^2$.

24. In the triangle ABC with vertices $A(2, 3), B(4, 1)$ and $C(1, 2)$, find the equation and length of altitude from the vertex A.

25. If p is the length of perpendicular from the origin to the line whose intercepts on the axes are a and b, then show that $\dfrac{1}{p^2} = \dfrac{1}{a^2} + \dfrac{1}{b^2}$.

Exercise 10 4

1. Find equation of line passes from point of intersection of $3x + 4y = 7$ and $x - y + 2 = 0$. whose slope is 5.

2. Find equation of the line passes from point of intersection of lines $x + 2y - 3 = 0$ and $4x - y + 7 = 0$. Whose is parallel to line $5x + 4y - 20 = 0$.

3. Find equation of line passes from point of intersection at lines $2x + 3y - 4 = 0$ and $x - 5y = 7$ whose x-intercept is -4.

4. Find equation of line passes from point of intersection at lines $5x - 3y = 1$ and $2x + 3y - 23 = 0$ and perpendicular to line $5x - 3y = 1$.

1. Find the new coordinates of the point in each of the following cases if origin is shifted to the point $(-3, -2)$ by translation of axes.

(i) $(1, 1)$

▶ Watch Video Solution

2. Find the new coordinates of the point in each of the following cases if origin is shifted to the point $(-3, -2)$ by translation of axes.

(ii) $(0, 1)$

▶ Watch Video Solution

3. Find the new coordinates of the point in each of the following cases if origin is shifted to the point $(-3, -2)$ by translation of axes.

(iii) $(5, 0)$

4. Find the new coordinates of the point in each of the following cases if origin is shifted to the point $(-3, -2)$ by translation of axes.

(iv) $(-1, -2)$

5. Find the new coordinates of the point in each of the following cases if origin is shifted to the point $(-3, -2)$ by translation of axes.

(v) $(3, -5)$

6. Find what the following equation becomes when origin is shifted of the point $(1, 1)$.

(i) $x^2 + xy - 3y^2 - y + 2 = 0$

7. Find what the following equation becomes when origin is shifted of the point $(1, 1)$.

(ii) $xy - y^2 - x + y = 0$

8. Find what the following equation becomes when origin is shifted of the point $(1, 1)$.

(iii) $xy - x - y + 1 = 0$

Miscellaneous Exercise 10

1. Find the values of k for which the line

$(k - 3)x - \left(4 - k^2\right)y + k^2 - 7k + 6 = 0$ is

(i) Parallel to the x-axis

Line $(k-3)x - (4-k^2)y + k^2 - 7k + 6 = 0$.

2. Find the values of k for which the line

$(k-3)x - (4-k^2)y + k^2 - 7k + 6 = 0$ is

(ii) Parallel to the y-axis.

3. Find the values of k for which the line

$(k-3)x - (4-k^2)y + k^2 - 7k + 6 = 0$ is

(iii) Passing through the origin.

4. Find the values of θ and p, if the equation $x \cos \theta + y \sin \theta = p$ is the normal form of the line $\sqrt{3}x + y + 2 = 0$.

▶ Watch Video Solution

5. Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6, respectively.

▶ Watch Video Solution

6. What are the points on the Y- axis whose distance from the line $\dfrac{x}{3} + \dfrac{y}{4} = 1$ is 4 units.

▶ Watch Video Solution

7. Find perpendicular distance from the origin to the line joining the points $(\cos \theta, \sin \theta)$ and $(\cos \phi, \sin \phi)$.

8. Find the equation of the line parallel to Y -axis and drawn through the point of intersection of the lines $x - 7y + 5 = 0$ and $3x + y = 0$.

9. Find the equation of a line drawn perpendicular to the line $\frac{x}{4} + \frac{y}{6} = 1$ through the point, where it meets the Y-axis.

10. Find the area of the triangle formed by the lines $y - x = 0, x + y = 0$ and $x - k = 0$.

11. Find the value of p so that the three lines $3x + y - 2 = 0$, $px + 2y - 3 = 0$ and $2x - y - 3 = 0$ may intersect at one point.

12. If three lines whose equations are $y = m_1x + c_1$, $y = m_2x + c_2$ and $y = m_3x + c_3$ are concurrent, then show that $m_1(c_2 - c_3) + m_2(c_3 - c_1) + m_3(c_1 - c_2) = 0$.

13. Find the equation of the lines through the point $(3, 2)$ which make an angle of $45°$ with the line $x - 2y = 3$.

14. Find the equation of the line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ and $2x - 3y + 1 = 0$ that has equal intercepts on the axes.

15. Show that the equation of the line passing through the origin and making an angle θ with the line $y = mx + c$ is $\dfrac{y}{x} = \dfrac{m \pm \tan\theta}{1 \pm m \tan\theta}$.

16. In what ratio, the line joining $(-1, 1)$ and $(5, 7)$ is divided by the line $x + y = 4$?

17. Find the distance of the line $4x + 7y + 5 = 0$ from the point $(1, 2)$ along the line $2x - y = 0$.

18. Find the direction in which a straight line must be drawn through the point $(- 1, 2)$. So that its point of intersection with the line $x + y = 4$ may be at a distance of 3 units from this point.

19. The hypotenuse of a right angled triangle has its ends at the points $(1, 3)$ and $(- 4, 1)$. Find an equation of the legs (perpendicular sides) of the triangle.

20. Find the image of the point $(3, 8)$ with respect to the line $x + 3y = 7$ assuming the line to be a plane mirror.

▶ Watch Video Solution

21. If the lines $y = 3x + 1$ and $2y = x + 3$ are equally inclined to the line $y = mx + 4$, find the value of m.

▶ Watch Video Solution

22. If sum of the perpendicular distances of a variable point $P(x, y)$ form the lines $x + y - 5 = 0$ and $3x - 2y + 7 = 0$ is always 10. Show that P must move on a line.

▶ Watch Video Solution

23. Find equation of the line which is equidistant from parallel lines $9x + 6y - 7 = 0$ and $3x + 2y + 6 = 0$.

24. A ray of light passing through the point $(1, 2)$ reflects on the X -axis at point A and the reflected ray passes through the point $(5, 3)$. Find the coordinates of A.

25. Prove that the product of the lengths of the perpendiculars drawn from the points $\left(\sqrt{a^2 - b^2}, 0\right)$ and $\left(-\sqrt{a^2 - b^2}, 0\right)$ to the line $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ is b^2.

26. A person standing at the junction (crossing) of two straight paths represented by the equations $2x - 3y + 4 = 0$ and $3x + 4y - 5 = 0$ wants to reach the path whose equation is $6x - 7y + 8 = 0$ in the least time. Find equation of the path that he should follow.

▶ **Watch Video Solution**

Practice Work

1. Prove that $(0, -1), (6, 7), (-2, 3)$ and $(8, 3)$ are the verticle at rectangle.

▶ **Watch Video Solution**

2. Find area at the quadrilateral ABCD with vertices $A(1, 1), B(7, -3), C(12, 2)$ and $D(7, 21)$.

▶ **Watch Video Solution**

3. $A(6, 3)$, $B(-3, 5)$, $C(4, -2)$ and $D(x, 3x)$ are given points. Find x if $\dfrac{\text{Area at} \triangle DBC}{\text{Area at} \triangle ABC} = \dfrac{1}{2}$.

4. Find point on Y -axis which is at the equidistance from the given points $A(-4, 3)$ and $B(5, 2)$.

5. Find distance PQ between the points $P(a \cos \alpha, a \sin \alpha)$ and $Q(a \cos \beta, a \sin \beta)$.

6. Find x if the slope of the line passes from points $A(x, 2)$ and $B(6, -8)$ is $-\dfrac{5}{4}$.

7. Without using Pythagoras theorem prove that $A(12, 8), B(-2, 6)$ and $C(6, 0)$ are the verticies of right angled triangle.

8. Using definition of slope prove that $P(4, 8), Q(5, 12)$ and $R(9, 28)$ are collinear points.

9. Find slope of the perpendicular line to the line passes from points $(0, 8)$ and $(-5, 2)$.

10. Find y if the line passes from points $(3, y)$ and $(2, 7)$ is parallel to the line passes from points $(-1, 4)$ and $(0, 6)$.

> ▶ Watch Video Solution

11. Prove that line passes from the points $A(4, -6)$ and $B(-2, -5)$ makes obtuse angle with X- axis.

> ▶ Watch Video Solution

12. $A(-2, 1), B(2, 3)$ and $C(-2, -4)$ are verticies of $\triangle ABC$. Find measure of $\angle B$.

> ▶ Watch Video Solution

13. Angle between two lines is 45º and slope of one line is 2 then find slope of second line.

> ▶ Watch Video Solution

14. $A(0, 2), B(- 2, - 1), C(4, 0)$ and $D(2, 3)$ are vertices of parallelogram ABCD. If angle between its diagonal is θ then prove that $\tan \theta = 3$.

15. Two lines passes through $(0, 0), (2, 3)$ and $(2, - 2), (3, 5)$. Find measure of an angle between them.

16. Obtain the equation of the line which satisfying given condition :

(1) Passes from points $A(- 1, 8)$ and $B(4, - 2)$.

17. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Equation of perpendicular bisector of $\overline{AB}$ joining $A(-2, 3)$ and $B(4, 5)$.

18. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Equation of the line whose X- intercept is 4 and slope $\dfrac{1}{2}$.

19. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Length of perpendicular from origin is 7 unit and slope -1.

20. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Passes from point $(-4, 3)$ and parallel to Y-axis.

21. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Equation of line with $p = 2$ and $\sin\theta = \dfrac{4}{5}$.

22. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Passes from point $(1, -2)$ and makes equal intercepts an axes.

23. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Equation of horizontal and vertical line passes from point $(-5, 6)$.

24. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Equation of line which is of the equidistance from the line $x = -2$ and $x = 6$.

25. Obtain the equation at the line in Ex. (1) to (10) satisfying given condition :

Length of perpendicular from origin is 7 unit and makes an angle $\dfrac{\pi}{6}$ with positive side of X-axis.

26. Prove that point $(4, 1)$ divides perpendicular line segment joining points $(6, 5)$ and $(2, -1)$ in ratio $8:5$ internally.

27. $A(5, 2), B(2, 3)$ and $C(6, 5)$ are the verticies of $\triangle ABC$. Find equation of internal bisector of $\angle BAC$.

28. Find equation of line whose sum and product of intercepts on axis are 1 and -6 respectively.

29. Line makes right angled triangle with axis whose area is 6 unit and length of its hypoteneous is 5 unit. Find equation of line.

30. Find equation of line L whose length of perpendicular from origin is 2 unit with slope $\dfrac{5}{12}$.

31. In which ratio line $x + y = 4$ divides line segment joining points $(-1, 1)$ and $(5, 7)$?

32. Equation at sides of rectangle are $x = a, x = a', y = b$ and $y = b'$. Obtain equation of its diagonals.

33. Find equation of line passes from point $P(1, -7)$ which intersects axis is at points A and B such that $4AP - 3BP = 0$.

34. $A(1, 4), B(2, -3)$ and $C(-1, -2)$ are the verticies at ΔABC then find, (1) Equation of median from A. (2) Equation of perpendicular from A. (3) Equation of perpendicular bisector of $\overline{BC}$.

35. Find the equation of line which makes a triangle with area $\dfrac{50}{\sqrt{3}}$ unit with axis and perpendicular from origin makes an angle $\dfrac{\pi}{6}$ with positive side of X-axis.

36. A ray of light passing through the point $(1, 2)$ reflects on the X -axis at point A and the reflected ray passes through the point $(5, 3)$. Find the coordinates of A.

37. Prove that line segment joining mid points of the two sides of the triangle is parallel to third side.

38. The Fahrenheit remperature F and absolute temperature K satisfy a linear equation. Given that $K = 273$ when $F = 32$and that K = 373 when F = 212.

Express K in terms of F and find the value of F, when K = 0 .

39. $L: 3x + 2y - 7 = 0$

(1) Reduce the above equation in slope intercept from. Find their slope and y -intercept.

(2) Reduce the equation into intercept from. Find their intercepts on axis.

(3) Reduce the equation in normal form and find perpendicular distance from origin and measure of an angle made by perpendicular with positive side of X -axis.

> ▶ Watch Video Solution

40. Find points on line $x + y + 3 = 0$ whose distance from line $x + 2y + 2 = 0$ is $\sqrt{5}$ unit.

> ▶ Watch Video Solution

41. Length of perpendicular from origin to the line $\dfrac{x}{a} + \dfrac{y}{b} = 1$ is p. If a^2, p^2 and b^2 are in A.P. then prove that $a^4 + b^4 = 0$.

> ▶ Watch Video Solution

42. Find perpendicular distance from point $(3, -1)$ to the line $12x - 5y - 7 = 0$.

> ▶ Watch Video Solution

43. If two sides of the quadrilateral are along the lines $x + 2y + 3 = 0$ and $x + 2y = 5$. Find its area.

> ▶ View Text Solution

44. Find equation of parallel line to line $2x + 3y + 11 = 0$ and whose sum of intercept is 15.

> ▶ Watch Video Solution

45. Find equation of line at the distance 3 from origin and perpendicular to the line $\sqrt{3}x - y + 5 = 0$.

46. Find equation of line whose y- intercept is $\dfrac{4}{3}$ and perpendicular to the line $3x - 4y + 11 = 0$.

47. Prove that lines $3x + y + 4 = 0, 3x + 4y = 20$ and $24x - 7y + 5 = 0$ are sides of an equilateral triangle.

48. One side and are vertex of the equilateral triangle is $2x + 2y - 5 = 0$ and $(1, 2)$ respectively. Find equation of other sides.

49. Find equation of lines which bisects the quadrents.

50. Prove that the product of the lengths of the perpendiculars drawn from the points $\left(\sqrt{a^2 - b^2}, 0\right)$ and $\left(-\sqrt{a^2 - b^2}, 0\right)$ to the line $\dfrac{x}{a}\cos\theta + \dfrac{y}{b}\sin\theta = 1$ is b^2.

51. Find equation of line passes from middle of two parallel lines $9x + 6y - 7 = 0$ and $3x + 2y + 6 = 0$.

52. Find length of perpendicular from origin to the lines passes from points $(\cos\theta, \sin\theta)$ and $(\cos\phi, \sin\phi)$.

53. Find foot of perpendicular from point $(2, 3)$ on the line $x + y + 1 = 0$.

54. Find the equation at line passes from point of intersection at lines $x + 2y = 5$ and $3x + 7y = 12$. which is perpendicular to line $3x + 4y = 10$.

55. Find equation of line passes from point of intersection at lines $4x - 3y - 1 = 0$ and $2x - 5y + 3 = 0$ which makes equal angle with axis.

▶ Watch Video Solution

---

56. Find equation of line passes from point of intersection at lines $x - y - 1 = 0$ and $2x - 3y + 1 = 0$. Which is (i) Parallel to X- axis. (ii) Parallel to Y- axis and (iii) Parallel to line $3x + 4y = 14$.

▶ Watch Video Solution

---

57. If origin is shifted to point $(1, -2)$ then find the new transformed form of the following equation.

(i) $2x^2 + y^2 - 4x + 4y = 0$

(ii) $y^2 - 4x + 4y + 8 = 0$

▶ Watch Video Solution

58. At which origin will be shifted so, that new coordinate at point $(4, 5)$ will be $(-3, 9)$?

59. On which point we shift origin so that new transformed form of the equation $y^2 + 4y + 8x - 2 = 0$ does not contain constant term and term does not contain y ?

60. Prove that area at triangle will remain same by shifting origin at any point.

61. By shifting origin at $(-2, 3)$ find new transformed form at the equation $y + 3x = 2$.

62. Find equation of line passes from $(\sqrt{3}, -1)$ whose perpendicular distance is $\sqrt{2}$ from origin.

63. Two oppositive verticies of rectangle are $(-3, 1)$ and $(1, 1)$. Also equation of one side is along the line $4x + 7y + 5 = 0$. Find equation of other sides of rectangle.

64. Lines $3x + 4y + 5 = 0$ and $4x - 3y - 10 = 0$ intersects at point A. B is the point on line $3x + 4y + 5 = 0$ and point C lies on line $4x - 3y - 10 = 0$. such that $AB = AC$. Find equation of $\overleftrightarrow{BC}$ passes from point $(1, 2)$.

65. Find image of point $(- 8, 12)$ with respect to line $4x + 7y + 13 = 0$.

▶ Watch Video Solution

66. Two sides of the triangle are along the lines $3x - 2y + 6 = 0$ and $4x + 5y - 20 = 0$. If ortho centre of the triangle is $(1, 1)$. Find the equation of third side of the triangle.

▶ Watch Video Solution

67. $A(0, - 1, - 2), B(3, 1, 4)$ and $C(5, 7, 1)$ are vertices of $\triangle ABD$ then find the measure of $\angle A$.

▶ Watch Video Solution

68. Point $(2, 1)$ has reflection as simple mirror $(5, 2)$. Find equation of line.

> ▶ **Watch Video Solution**

69. Base of the equilateral triangle is along the line $x + y - 2 = 0$ and its one vertex is $(2, -1)$. Find area of triangle.

> ▶ **Watch Video Solution**

70. Find equation of line passess from point $(2, 3)$ and cuts line segment of length $\dfrac{2\sqrt{2}}{3}$. between the lines $2x + y = 3$ and $2x + y = 5$.

> ▶ **View Text Solution**

71. Find equation of line whose sum and product of intercepts on axis are 7 and 12 respectively.

72. Without finding point of intersection obtain the equation of line passes from point of intersection of lines $5x + y + 4 = 0$ and $2x + 3y - 1 = 0$. which is parallel to the line $4x - 2y - 1 = 0$.

73. Two adjacent sides of the parallogram are $4x + 5y = 0$ and $7x + 2y = 0$ one diagonal of the parallogram is along line $11x + 7y = 9$. Then find equation of other diagonal.

74. If m_1 and m_2 are the roots of the equation $x^2 + (\sqrt{3} + 2)x + \sqrt{3} - 1 = 0$ then prove that area of the triangle formed by the lines $y = m_1 x$, $y = m_2 x$ and $y = c$ is $\dfrac{c^2}{4}(\sqrt{33} + \sqrt{11})$.

75. Find distance from point $(3, 5)$ to the line $2x + 3y = 14$ and the distance to the line parallel to $x - 2y = 1$.

76. If the lines $ax + y + 1 = 0$, $x + by + 1 = 0$ and $x + y + c = 0$ are concurrent then prove that,

$$\frac{1}{1 - a} + \frac{1}{1 - b} + \frac{1}{1 - c} = .$$

Text Based Mcqs

1. .... is the equation of line passes from point $A\left(2, -\frac{3}{2}\right)$ and parallel to X- axis.

A. $x = 2$

B. $2x - 3 = 0$

C. $2y - 3 = 0$

D. $2y + 3 = 0$

Answer: D

▶ **Watch Video Solution**

---

2. Line $x + y = 4$ divides $\overline{AB}$ joining $A(- 2, 3)$ and $B(1, 5)$ in ratio $1 : \lambda$ form A then $\lambda = \ldots \ldots$

A. $3 : 2$

B. $2 : 3$

C. $1 : 3$

D. $- 2 : 3$

Answer: B

3. Perpendicular distance from origin to line $3x + 4y + 10 = 0$ is ....

A. -2

B. $\dfrac{2}{5}$

C. $\dfrac{1}{5}$

D. 2

Answer: D

4. $(1, 2), (2, 1),$ $\left(\dfrac{3 + \sqrt{3}}{2}, \dfrac{3 + \sqrt{3}}{2} \right)$ are verticies of triangle. Then distance between circumcentre and orthocentre is ....

A. 0

B. $\sqrt{2}$

C. $3 + \sqrt{3}$

D. None of these

Answer: A

▶ **Watch Video Solution**

---

5. Two maiden are drawn from the verticies of an acute angles of the isosceless right angled triangle then angle between them is ....

A. $\cos^{-1}\left(\dfrac{2}{3}\right)$

B. $\cos^{-1}\left(\dfrac{3}{4}\right)$

C. $\cos^{-1}\left(\dfrac{4}{5}\right)$

D. $\cos^{-1}\left(\dfrac{5}{6}\right)$

Answer: C

▶ **Watch Video Solution**

6. .... is the y intersept of the line passes from point $(2, 2)$ and perpendicular to $3x + y = 3$.

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. 1

D. $\dfrac{4}{3}$

Answer: D

▶ **Watch Video Solution**

7. Area of the triangle with verticies $(-4, 1), (1, 2)$ and $(4, -3)$ is ....

A. 17

B. 16

C. 15

D. None of these

Answer: A

---

8. In .... ratio Y-axis divides line segment joining points $(-3, -4)$ and $(1, -2)$.

A. $1 : 3$

B. $2 : 3$

C. $3 : 1$

D. $3 : 2$

Answer: C

---

9. P_1 and P_2 are the length of perpendicular from origin to the line $x \sec \theta + y \cos ec\theta = a$ and $x \cos \theta - y \sin \theta = a \cos 2\theta$ then .... of the

following is valid.

A. $4P_1^2 + P_2^2 = a^2$

B. $P_1^2 + 4P_2^2 = a^2$

C. $P_1^2 + P_2^2 = a^2$

D. None of these

Answer: A

▶ Watch Video Solution

10. If $a + b + c = 0$ then line $3ax + by + c = 0$ passes from ....of the

following point.

A. $\left(2, \dfrac{2}{3} \right)$

B. $\left(\dfrac{2}{3}, 2 \right)$

C. $\left(-2, \dfrac{2}{3} \right)$

D. None of these

Answer: B

11. Lines $ax \pm by \pm c = 0$ represents .... of the following.

   A. Rectangle

   B. Square

   C. Rhombus

   D. None of these

Answer: C

12. $(5, 2)$ is the mid point of the line segment intercepted between axes then equation of line is..............

A. $5x + 2y = 20$

B. $2x + 5y = 20$

C. $5x - 2y = 20$

D. $2x - 5y = 20$

Answer: B

▶ Watch Video Solution

---

13. $P - \alpha$ form of the line $x + \sqrt{3}y - 4 = 0$ is.........

A. $x\dfrac{\cos(\pi)}{6} + y\dfrac{\sin(\pi)}{6} = 2$

B. $x\dfrac{\cos(\pi)}{3} + y\dfrac{\sin(\pi)}{3} = 2$

C. $x\cos\left(-\dfrac{\pi}{3}\right) + y\sin\left(-\dfrac{\pi}{3}\right) = 2$

D. $x\cos\left(-\dfrac{\pi}{6}\right) + y\sin\left(-\dfrac{\pi}{6}\right) = 2$

Answer: B

▶ Watch Video Solution

14. If the lines $x \cos \alpha + y \sin \alpha = P$ and $x - \sqrt{3}y + 1 = 0$ are mutually perpendicular then $\alpha = $ . . . .

A. $\dfrac{\pi}{2}$

B. $\dfrac{\pi}{4}$

C. $\dfrac{\pi}{3}$

D. $\dfrac{\pi}{3}$

Answer: C

▶ Watch Video Solution

15. Perpendicular distance between $3x + 4y - 5 = 0$ and $6x + 8y - 15 = 0$ is ....

A. 1

B. $\dfrac{1}{2}$

C. $\dfrac{22}{10}$

D. 2

Answer: B

▶ Watch Video Solution

---

16. Lines $3x + 4y = 5, 5x + 4y = 4$ and $\lambda x + 4y = 6$ passes from unique point then value of $\lambda = \ldots.$

A. 2

B. 1

C. 3

D. 4

Answer: B

▶ Watch Video Solution

17. $(2, 7)$ is the centroid of the triangle with verticies $(4, 8)$ and $(- 2, 6)$ then its third vertex is ....

    A. $(0, 0)$

    B. $(4, 7)$

    C. $(7, 4)$

    D. $(7, 7)$

Answer: B

▶ **Watch Video Solution**

---

18. $A(0, b)$, $B(0, 0)$ and $C(a, 0)$ are verticies of $\triangle ABC$. If the medians $\overline{AD}$ and $\overline{BE}$ are mutually perpendicular then ...... of the following is true.

    A. $a = \dfrac{b}{2}$

    B. $b = \dfrac{a}{2}$

    C. $ab = 1$

D. $a = \pm\sqrt{2}b$

Answer: D

19. .... is the foot of perpendicular from point $(-2, 3)$ to the line $2x - y - 3 = 0$.

A. $(-2, 3)$

B. $(2, 1)$

C. $(3, 2)$

D. $(1, 2)$

Answer: B

20. .... of the following is the line joining the point of intersection $y - x + 7 = 0$ and $y + 2x - 2 = 0$ and origin.

A. $3x + 3y = 0$

B. $3x - 4y = 0$

C. $4x - 3y = 0$

D. $4x + 3y = 0$

Answer: D

▶ **Watch Video Solution**

---

21. Angle between the .... intersecting lines $2x - y + 3 = 0$ and $x + 2y + 3 = 0$.

A. $90°$

B. $60°$

C. $45°$

D. $30°$

22. .... Is the line passes from point $(1, 2)$ and perpendicular to the line $x + y + 7 = 0$.

    A. $x + y + 3 = 0$

    B. $x - y + 1 = 0$

    C. $y - x + 1 = 0$

    D. $2x - y = 0$

Answer: B

23. Lines $ax + by = c$ and $a'x + b'y = c'$ are mutually perpendicular then .... of the following is valid.

    A. $aa' = \mathit{l}$

    B. $aa' + \mathit{l} = 0$

    C. $aa' - \mathit{l} = 0$

    D. $ab' + a'b = 0$

Answer: B

▶ **Watch Video Solution**

24. Angle between the lines $\dfrac{x}{a} + \dfrac{y}{b}$ and $\dfrac{x}{a} - \dfrac{y}{b} = 1$ is ....

    A. $\tan^{-1}\left(\dfrac{2ab}{a^2 - b^2}\right)$

    B. $\tan^{-1}\left(\dfrac{2ab}{a^2 + b^2}\right)$

    C. $\tan^{-1}\left(\dfrac{a + b}{a - b}\right)$

    D. $\tan^{-1}\left(\dfrac{2ab}{a + b}\right)$

Answer: A

---

25. If the lines

$$mx + (2m + 3)y + m + 6 = 0 \text{ and } (2m + 1)x + (m - 1)y + m - 9 = 0$$

intersects on Y-axis then $m = \ldots\ldots$

A. -1 OR 21

B. 1 OR 21

C. -1 OR -21

D. $-\dfrac{1}{2}$ OR $-\dfrac{3}{2}$

Answer: D

Latest Exam Mcqs

1. Line passess from fixed point $(2, 3)$ intersects axis of points P and Q. If O is origin and OPRQ will be rectangle then locus of point R is ....

    A. $3x + 2y = 6$

    B. $2x + 3y = xy$

    C. $3x + 2y = xy$

    D. $3x + 2y = 6xy$

Answer: C

▶ Watch Video Solution

Textbook Illustrations For Practice Work

1. Find the slope of the lines :

(a) Passing through the points $(3, -2)$ and $(-1, 4)$,

▶ Watch Video Solution

2. Find the slope of the lines :

(b) Passing through the points $(3, \ -2)$ and $(7, \ -2)$,

> ▶ Watch Video Solution

3. Find the slope of the lines :

(c) Passing through the points $(3, \ -2)$ and $(3, 4)$,

> ▶ Watch Video Solution

4. Find the slope of the lines :

(d) Making inclination of 60° with the positive direction of x-axis.

> ▶ Watch Video Solution

5. If the angle between two lines is $\dfrac{\pi}{4}$ and slope of one of the lines is $\dfrac{1}{2}$,

find the slope of the other line.

6. Line through the points $(-2, 6)$ and $(4, 8)$ is perpendicular to the line through the points $(8, 12)$ and $(x, 24)$. Find the value of x.

7. Three points $P(h, k)$, $Q(x_1, y_1)$ and $R(x_2, y_2)$ lie on a line. Show that, $(h - x_1)(y_2 - y_1) = (k - y_1)(x_2 - x_1)$.
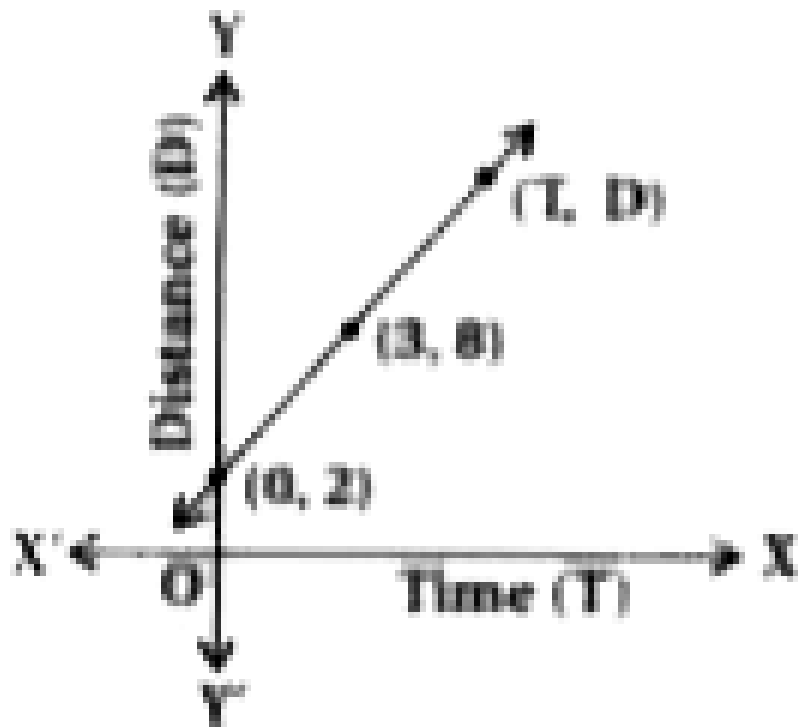
8. In Figure, time and distance graph of a linear motion is given.

Two positions of time and distance are recorded as, when $T = 0, D = 2$ and when $T = 3, D = 8$. Using the concept of slope, find law of motion,

i.e., how distance depends upon time.

9. Find the equations of the lines parallel to axes and passing through $(-2, 3)$.

10. Find the equation of the line through $(-2, 3)$ with slope -4.

11. Write the equation of the line through the points $(1, -1)$ and $(3, 5)$.

12. Write the equation of the lines for which $\tan \theta = \dfrac{1}{2}$, where θ is the

(i) y -intercept is $= -\dfrac{3}{2}$

13. Write the equation of the lines for which $\tan \theta = \dfrac{1}{2}$, where θ is the

(ii) x intercept is $= 4$.

14. Find the equation of the line, which makes intercepts -3 and 2 on

the $x-$ and $y-$ axes respectively.

15. Find the equation of the line whose perpendicular distance from the

origin is 4 units and the angle which the normal makes with positive

direction of x -axis is 15º.

16. The fahrenheit temperature F and absolute temperature K satisfy the

linear equation. Given that $K = 273$ when $F = 32$ and that $K = 373$

when $F = 212$. Express K in terms of F also find value of F when $K = 0$.

17. Equation of a line is $3x - 4y + 10 = 0$. Find its

(i) slope,

18. Equation of a line is $3x - 4y + 10 = 0$. Find its

(ii) x -intercepts and y -intercepts.

19. Reduce the equation $\sqrt{3}x + y - 8 = 0$ into normal form. Find the value of p and ω.

20. Find the angle between the lines $y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$.

21. Show that two lines $a_1x + b_{14}y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, where $b_1, b_2 \neq 0$ are

(i) Parallel if $\dfrac{a_1}{b_1} = \dfrac{a_2}{b_2}$ and

22. Show that two lines $a_1x + b_{14}y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, where $b_1, b_2 \neq 0$ are Perpendicular if $a_1a_2 + b_1b_2 = 0$.

23. Find the equation of a line perpendicular to the line $x - 2y + 3 = 0$ and passing through the point $(1, -2)$.

24. Find the distance of the point $(3, -5)$ from the line $3x - 4y - 26 = 0.$

25. Find the distance between the parallel lines $3x - 4y + 7 = 0$ and $3x - 4y + 5 = 0.$

26. Find the equation of line parallel to the Y- axis and drawn through the point of intersection of $x - 7 + 5 = 0$ and $3x + y - 7 = 0.$

27. Find the new coordinates of point $(3, -4)$ if the origin is shifted to $(1, 2)$ by a translation.

28. Find the transformed equation of the straight line $2x - 3y + 5 = 0$, when the origin is shifted to the point $(3, -1)$ after translation of axes.

29. If the lines $2x + y - 3 = 0, 5x + ky - 3 = 0$ and $3x - y - 2 = 0$ are concurrent, find the value of k.

30. Find the distance of the line $4x - y = 0$ from the point P $(4, 1)$ measured along the line making an angle of $135°$ with the positive x- axis.

31. Assuming that straight lines work as the plane mirror for a point, find the image of the point $(1, 2)$ in the line $x - 3y + 4 = 0$.

32. Show that the area of the triangle formed by the lines $y = m_1 x + c_1, y = m_2 x + c_2$ and $x = 0$ is $\dfrac{(c_1 - c_2)^2}{2|m_1 - m_2|}$.

33. A line is such that its segment between the lines $5x - y + 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point $(1, 5)$. Obtain its equation.

34. Show that the path of a moving point such that its distances from two lines $3x - 2y = 5$ and $3x + 2y = 5$ are equal is a straight line.

Solutions Of Ncert Exemplar Problems Short Answer Type Questions

1. Find the equation of the straight line which passes through the point $(1, -2)$ and cuts off equal intercepts from axes.

2. Find the equation of the line passing through the point $(5, 2)$ and perpendicular to the line segment joining the points $(2, 3)$ and $(3, -1)$.

3. Find the angle between the lines

$l_1 : y = \left(2 - \sqrt{3}\right)(x + 5)$ and

$l_2 : y = \left(2 + \sqrt{3}\right)(x - 7)$.

Thinking Process : If the angle between the lines having the slope m_1 and m_2 is θ then $\tan\theta = \left|\dfrac{m_1 - m_2}{1 + m_1 m_2}\right|$. Use this formula to solve the above problem.

▶ Watch Video Solution

4. Find the equation of the lines which passes through the point (3, 4) and cuts off intercepts from the coordinate axes such that their sum is 14.

▶ Watch Video Solution

5. Find the points on the line $x + y = 4$ which lie at a unit distance from the line $4x + 3y = 10$.

▶ Watch Video Solution

6. Show that the tangent of an angle between the lines $\dfrac{x}{a} + \dfrac{y}{b} = 1$ and $\dfrac{x}{a} - \dfrac{y}{b} = 1$ is $\dfrac{2ab}{a^2 - b^2}$.

7. Find the equation of lines passing through $(1, 2)$ and making angle $30°$ with Y- axis.

Thinking Process : Equation of a line passing through the point (x_1, y_1) and having slope m is $y - y_1 = m(x - x_1)$.

8. Find the equation of the line passing through the point of intersection of $2x + y = 5$ and $x + 3y + 8 = 0$ and parallel to the line $3x + 4y = 7$.

Thinking Process : First find point of intersection of given lines and take slope m of intersection of given lines and take slope m of $y - y_1 = m(x - x_1)$.

9. For what values of a and b the intercepts cut off on the coordinate 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?

10. If the intercept of a line between the coordinate axes is divided by the point $(-5, 4)$ in the ratio $1:2$, then find the equation of the line.

Thinking Process : Coordinates of the point which divides line segment joining (x_1, y_1) and (x_2, y_2) in ratio $(m_1 : m_2) \left(\dfrac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \dfrac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$.

11. Find the 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 positive direction of X -axis.

Thinking Process : Equation of line which makes an angle α with positive side of X axis and whose length of perpendicular from origin p is given by $x \cos \alpha + y \sin \alpha = p$.

▶ **Watch Video Solution**

12. Find the equation of one of the sides of an isosceles right angled triangle whose hypotenuse is given by $3x + 4y = 4$ and the opposite vertex of the hypotenuse is $(2, 2)$.

▶ **Watch Video Solution**

Solutions Of Ncert Exemplar Problems Long Answer Type Questions

1. If the equation of the base of an equilateral triangle is $x + y = 2$ and the vertex is $(2, \ -1)$, then find the length of the side of the triangle.

2. A variable line passes through a fixed point P. The algebraic sum of the perpendiculars drawn from the points $(2, 0), (0, 2)$ and $(1, 1)$ on the line is zero. Find the coordinates of the point P.

3. In what direction should 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 $\dfrac{\sqrt{6}}{3}$ from the given point ?

4. A straight line moves so that the sum of the reciprocals of its intercepts made on axes is constant. Show that the line passes through a fixed point.

Thinking Process : For line which makes intercepts on axis $\dfrac{x}{a} + \dfrac{y}{b} = 1$ If $\dfrac{1}{a} + \dfrac{1}{b} =$ constant $\left(\dfrac{1}{k}\right)$ then $\dfrac{k}{a} + \dfrac{k}{b} = 1$ and we say if passes from point (k, k).

▶ **Watch Video Solution**

5. Find the 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 ratio $5 : 3$ by this point.

▶ **Watch Video Solution**

6. Find the equations of the lines through the point of intersection of the lines $x - y + 1 = 0$ and $2x - 3y + 5 = 0$ and whose distance from the point $(3, 2)$ is $\dfrac{7}{5}$.

7. If the sum of the distances of a moving point in a plane from the axes is 1, then find the locus of the point.

Thinking Process : Given that $|x| + |y| = 1$ which gives four sides of a square.

8. P_1, P_2 are points on either of the two lines $y - \sqrt{3}|x| = 2$ at a distance of 5 units from their point of intersection. Find the coordinates of the foot of perpendiculars drawn from P_1, P_2 on the bisector of the angle between the given lines.

Thinking Process : Here, equation $y - \sqrt{3}|x| = 2$ represents two different lines for $x > 0$ and $x < 0$ and they are bisector of Y -axis. P_1 and P_2 are points at a distance 5 unit from point of intersection. The y coordinate of the foot of perpendicular on Y-axis is $2 + 5\cos(30°)$.

9. If p is the length of perpendicular from the origin on the line $\dfrac{x}{a} + \dfrac{y}{b} = 1$ and a^2, p^2 and b^2 are in A.P., then show that $a^4 + b^4 = 0$.

> ▶ Watch Video Solution

1. A line cutting off intercept -3 from the Y-axis and the tangent at angle to the X -axis is $\dfrac{3}{5}$, its equation is,

A. $5y - 3x15 = 0$

B. $3y - 5x + 15 = 0$

C. $5y - 3x - 15 = 0$

D. None of these

Answer: A

> ▶

2. Slope of a line which cuts off intercepts of equal lengths on the axes is

....

   A. -1

   B. 0

   C. 2

   D. $\sqrt{3}$

Answer: A

3. The equation of the straight line passing through the point $(3, 2)$ and perpendicular to the line $y = x$ is,

   A. $x - y = 5$

   B. $x + y = 5$

C. $x + y = 1$

D. $x - y = 1$

Answer: B

▶ Watch Video Solution

---

4. The equation of the line passing through the point $(1, 2)$ and perpendicular to the line $x + y + 1 = 0$ is

A. $y - x + 1 = 0$

B. $y - x - 1 = 0$

C. $y - x + 2 = 0$

D. $y - x - 2 = 0$

Answer: B

▶ Watch Video Solution

5. The tangent of angle between the lines whose intercepts on the axes are $a,\ -b$ and $b,\ -a$, respectively, is

A. $\dfrac{a^2 - b^2}{ab}$

B. $\dfrac{b^2 - a^2}{2}$

C. $\dfrac{b^2 - a^2}{2ab}$

D. None of these

Answer: C

▶ **Watch Video Solution**

---

6. If the line $\dfrac{x}{a} + \dfrac{y}{b} =$ passes through the points $(2,\ -3)$ and $(4,\ -5)$ then (a, b) is

A. $(1, 1)$

B. $(-1, 1)$

C. $(1, -1)$

D. $(-1, -1)$

Answer: D

7. The distance of the point of intersection of the lines $2x - 3y + 5 = 0$ and $3x + 4y = 0$ from the line $5x - 2y = 0$ is

A. $\dfrac{130}{17\sqrt{29}}$

B. $\dfrac{13}{7\sqrt{29}}$

C. $\dfrac{130}{7}$

D. None of these

Answer: A

8. The equations of the lines which pass through the point $(3, -2)$ and are inclined at 60° to the line $\sqrt{3}x + y = 1$ is

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

Answer: D

▶ **Watch Video Solution**

---

9. The equations of the lines passing through the point $(1, 0)$ and at a distance $\dfrac{\sqrt{3}}{2}$ from the origin, are

A. $\sqrt{3}x + y - \sqrt{3} = 0, \sqrt{3}x - y - \sqrt{3} = 0$

B. $\sqrt{3}x + y + \sqrt{3} = 0, \sqrt{3}x - y + \sqrt{3} = 0$

C. $x + \sqrt{3}y - \sqrt{3} = 0, \sqrt{3}y - \sqrt{3} = 0$

D. None of these

Answer: A

---

10. The distance between the lines $y = mx + c_1$ and $y = mx + c_2$ is

A. $\dfrac{c_1 - c_2}{\sqrt{m^2 + 1}}$

B. $\dfrac{|c_1 - c_2|}{\sqrt{1 + m^2}}$

C. $\dfrac{|c_1 - c_2|}{\sqrt{1 + m^2}}$

D. 0

Answer: B

11. The coordinates of the foot of perpendiculars from the point $(2, 3)$ on the line $y = 3x + 4$ is given by,

A. $\left(\dfrac{37}{10}, \dfrac{-1}{10} \right)$

B. $\left(-\dfrac{1}{10}, \dfrac{37}{10} \right)$

C. $\left(\dfrac{10}{37}, -10 \right)$

D. $\left(\dfrac{2}{3}, -\dfrac{1}{3} \right)$

Answer: B

▶ **Watch Video Solution**

---

12. If the coordinates of the middle point of the portion of a line intercepted between the coordinate axes is $(3, 2)$, then the equation of the line will be

A. $2x + 3y = 12$

B. $3x + 2y = 12$

C. $4x - 3y = 12$

D. $5x - 2y = 10$

Answer: A

---

13. Equation of the line passing through $(1, 2)$ and parallel to the line $y = 3x - 1$ is

A. $y + 2 = x + 1$

B. $y + 2 = 3(x + 1)$

C. $y - 2 = 3(x - 1)$

D. $y - 2 = x - 1$

Answer: C

14. Equations of diagonals of the square formed by the lines $x = 0, y = 0, x = 1$ and $y = 1$ are

A. $y = x, y + x = 1$

B. $y = x, x + y = 2$

C. $2y = x, y + x = \dfrac{1}{3}$

D. $y = 2x, y + 2x = 1$

Answer: A

▶ **Watch Video Solution**

---

15. For specifying a straight line, how many geometrical parameters should be known ?

A. 1

B. 2

C. 4

D. 3

Answer: B

---

16. 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 coordinates of the point are

A. $(4, 3)$

B. $(3, 4)$

C. $(1, 4)$

D. $\left(\dfrac{7}{2}, \dfrac{7}{2}\right)$

Answer: B

17. A point equidistant from the lines $4x + 3y + 10 = 0, 5x - 12y + 26 = 0$ and $7x + 24y - 50 = 0$ is,

A. $(1, \, - 1)$

B. $(1, \, 1)$

C. $(0, \, 0)$

D. $(0, \, 1)$

Answer: C

▶ **Watch Video Solution**

18. A line passes through $(2, 2)$ and is perpendicular to the line $3x + y = 3$. Its y-intercept is

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. 1

D. $\dfrac{4}{3}$

Answer: D

> ▶ Watch Video Solution

---

19. The ratio in which the line $3x + 4y + 2 = 0$ divides the distance between the lines $3x + 4y + 5 = 0$ and $3x + 4y - 5 = 0$ is

A. $1:2$

B. $3:7$

C. $2:3$

D. $2:5$

Answer: B

> ▶ Watch Video Solution

20. One vertex of the equilateral triangle with centroid at the origin and one side as $x + y - 2 = 0$ is

A. $(-1, -1)$

B. $(2, 2)$

C. $(-2, -2)$

D. $(2, -2)$

Answer: C

> ▶ Watch Video Solution

Solutions Of Ncert Exemplar Problems Fillers

---

1. If a, b and c are in AP then the straight lines $ax + by + c = 0$ will always pass through. ....

> ▶ Watch Video Solution

2. The line which cuts off equal intercept from the axes and pass through the point $(1, -2)$ is ....

3. Equations of the lines through the point $(3, 2)$ and making an angle of $45°$ with the line $x - 2y + 3 = 0$ are ....

4. The points $(3, 4)$ and $(2, -6)$ are situated on the .... of the line $3x - 4y - 8 = 0$.

5. A point moves so that square of its distance from the point$(3, -2)$ is numerically equal to its distance from the line $5x - 12y = 3$. The

equation of its locus is ....

6. Locus of the mid-points of the portion of the line $x \sin\theta + y \cos\theta = p$ intercepted between the axes is..........

7. If the vertices of a triangle have integral coordinates, then the triangle can not be equilateral.

8. The points $A(-2, 1), B(0, 5), C(-1, 2)$ are collinear.

9. Equation of the line passing through the point $\left(a\cos^3\theta, a\sin^3\theta\right)$ and perpendicular to the line $x\sec\theta + y\cos ec\theta = a$ is $x\cos\theta - y\sin\theta = \cos 2\theta$.

10. The straight line $5x + 4y = 0$ passes through the point of intersection of the straight lines $x + 2y - 10 = 0$ and $2x + y + 5 = 0$. True or False.

11. The vertex of an equilateral triangle is $(2, 3)$ and the equation of the opposite side is $x + y = 2$. Then the other two sides are $y - 3 = \left(2 \pm \sqrt{3}\right)(x - 2)$.

12. The equation of the line joining the point {3, 5) to the point of intersection of the lines $4x + y - 1 = 0$ and $7x - 3y - 35 = 0$ is equidistant from the points $(0, 0)$ and $(8, 34)$.

13. The line $\dfrac{x}{a} + \dfrac{y}{b} = 1$ moves in such a way that $\dfrac{1}{a^2} + \dfrac{1}{b^2} = \dfrac{1}{c^2}$, where c is a constant. The locus of the foot of the perpendicular from the origin on the given line is $x^2 + y^2 = c^2$

14. The lines $ax + 2y + 1 = 0, bx + 3y + 1 = 0$ and $cx + 4y + 1 = 0$ are concurrent if a, b, c are in A.P.

15. Line joining the points $(3, -4)$ and $(-2, 6)$ is perpendicular to the line joining the points $(-3, 6)$ and $(9, -18)$.

> ▶ Watch Video Solution

1. Match Column - I and Column - II.

Column - I

(i) The coordinates of the points P and Q on the line$x + 5y = 13$ which ar

(ii) The coordinates of the point on the line$x + y = 4,$which are at a unit d

(iii) The coordinates of the point on the line joining A(-2, 5) and B(3, 1) su

> ▶ View Text Solution

2. The value of the λ, if the lines $(2x + 3y + 4) + \lambda(6x - y + 14) = 0$

are

Column- I	Column - II
(i) Parallel to Y -axis is	(a)$\lambda = \frac{-3}{4}$
(ii) Perpendicular to$7x + y - 4 = 0$is	(b)$\lambda = \frac{-1}{3}$
(iii) Passes through $(1, 2)$ is	(c)$\lambda = \frac{-17}{41}$
(iv) parallel to X -axis is	(d)$\lambda = 3$

▶ Watch Video Solution

3. The equation of the line through the intersection of the lines

$2x - 3y = 0$ and $4x - 5y = 2$ and

Column - I	Column - II
(i) through the point $(2, 1)$ is	(a)$(2x - y = 4)$
(ii) perpendicular to the line$x + 2y + 1 = 0$is	(b)$x + y - 5 = 0$
(iii) parallel to the line$3x - 4y + 5 = 0$is	(c)$x - y - 1 = 0$
(iv) equally inclined to the axis is	(d)$3x - 4y - 1 = 0$

▶ Watch Video Solution

Question Of Module Knowledge Test

1. Find distance between the points $A(3, 4)$ and $B(-4, 3)$.

▶ Watch Video Solution

2. Obtain co-ordinates of mid-point of $\overline{AB}$ joining $A(1, 2)$, $B(7, 8)$.

3. Find area of triangle with verticies $A(2, 3)$, $B(-1, 4)$ and $C(-2, -1)$.

4. Find slope of $\overline{AB}$ joining points $A(4, 5)$, $B(-3, 4)$.

5. If line makes an angle of $45°$ with the positive side of X -axis then write its slope.

6. If line makes an angle 45º with X -axis then write its slopes.

7. Find measure of an angle between the lines $x + y = 3$ and $2x + 5y - 7 = 0$.

8. Find measure of an angle between the lines $x = 3$ and $2x - y - 5 = 0$

9. Y intercept of line $24x - 10 = 0$ is ....

10. .... is equation of line with slope $-\sqrt{3}$ and X- intercept 5.

11. Y -intercept of line $y = 0$ is ....

12. Find a if line $(a + 1)x + (a^2 + a - 2)y + a = 0$ is parallel to Y-axis.

13. Find k if lines $5x - ky - 7 = 0$ and $2x + 3y + 5 = 0$ are mutually perpendicular.

14. Find equation of line passes from points $(5, 6)$ and $(-3, 6)$.

15. Find P and α by converting equation $x + y = 1$ in $x \cos \alpha + y \sin \alpha = P$ form.

16. Find perpendicular distance from point $(2, 3)$ to the line $3x + 4y - 5 = 0$.

17. Find perpendicular distance between the lines $3x - 4y + 7 = 0$ and $6x - 8y + 1 = 0$.

18. Find k if the perpendicular distance between lines $5x + 12y = 1$ and $5x + 12y + k = 0$ is 25 unit.

▶ Watch Video Solution