



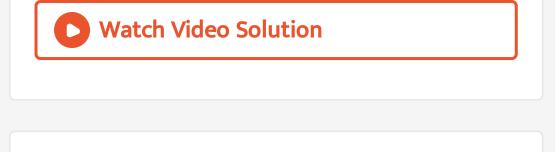
MATHS

BOOKS - PSEB

STRAIGHT LINES



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



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).

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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.

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



8. Find the value of x for which the points (x,

-1), (2, 1) and (4, 5) are collinear.



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



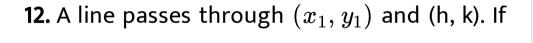
10. Find the angle between the x-axis and the

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.

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slope of line is m, show that

$$k-y_1=m(h-x_1).$$

13. If three points (h, 0), (a, b) and (0, k) lies on a line, show that $\frac{a}{h} + \frac{b}{k} = 1$ Watch Video Solution

14. In the following , find the equation of the line which satisfy the given conditions: Passing through the point (-4,3) with slope $\frac{1}{2}$.



15. In the following , find the equation of the line which satisfy the given conditions: Passing through (0, 0) with slope m.



16. In the following , find the equation of the line which satisfy the given conditions: Passing through $(2, 2\sqrt{3})$ and inclined with the x-axis at an angle of 75° .

17. In the following , find the equation of the line which satisfy the given conditions: Intersecting the x-axis at a distance of 3 units to the left of origin with slope -2.

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18. In the following , find the equation of the line which satisfy the given conditions: Intersecting the y-axis at a distance of 2 units

above the origin and making an angle of 30°

with positive direction of the x-axis.



19. In the following , find the equation of the

line which satisfy the given conditions: Passing

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

20. In the following , find the equation of the line which satisfy the given conditions: Perpendicular distance from the origin is 5 units and the angle made by the perpendicular with the positive x-axis is 30° .

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



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

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23. 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.

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

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



26. Find equation of the line through the point (0, 2) making an angle $\frac{2\pi}{3}$ 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.



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

28. 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.



29. 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?

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30. P (a, b) is the mid-point of a line segment between axis. Show' that equation of the line

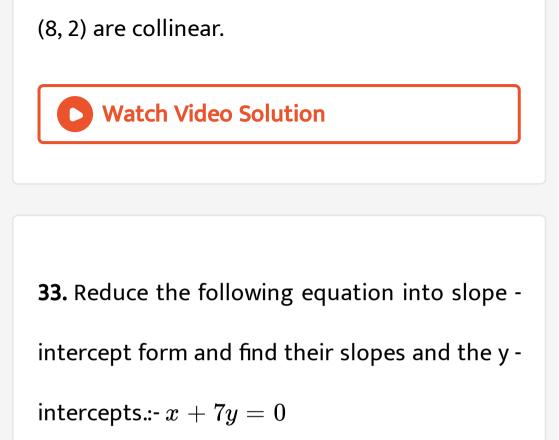
is
$$rac{x}{a}+rac{y}{b}=2.$$

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

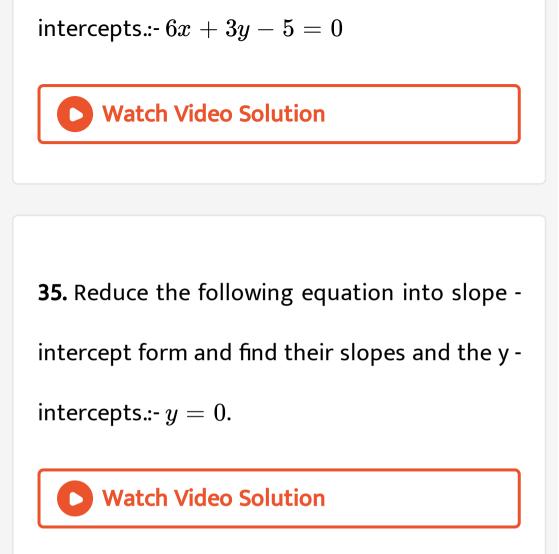
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32. By using the concept of equation of a line, prove that the three points (3, 0), (- 2, -2) and



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34. Reduce the following equation into slope - intercept form and find their slopes and the y -



36. Reduce the following equation into intercept form and find their intercepts on the

axes.:- 3x + 2y - 12 = 0

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37. Reduce the following equation into intercept form and find their intercepts on the axes.:- 4x - 3y = 6

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38. Reduce the following equation into intercept form and find their intercepts on the

axes.:- 3y + 2 = 0.

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39. Reduce the following equation into normal form. Find their perpendicular distances from the origin and angle between perpendicular and the positive x-axis.:- $x - \sqrt{3}y + 8 = 0$

40. Reduce the following equation into normal form. Find their perpendicular distances from the origin and angle between perpendicular and the positive x-axis.:- y - 2 = 0,

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41. Reduce the following equation into normal form. Find their perpendicular distances from the origin and angle between perpendicular and the positive x-axis.:- x - y = 4.



42. Find the distance of the point (-1, 1) from

the line 12(x+6) = 5(y-2).

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

44. Find the distance between parallel lines:-

15x + 8y - 34 = 0 and 15x + 8y + 31 = 0

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45. Find the distance between parallel lines:-

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



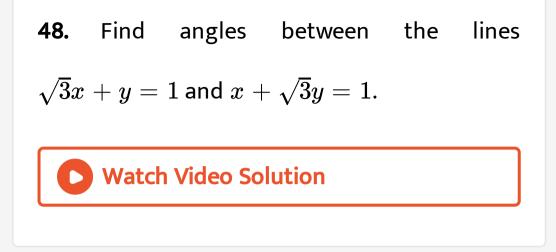
46. Find equation of the line parallel to the line 3x - 4y + 2 = 0 and passing through the point (-2, 3).



47. Find equation of the line perpendicular to

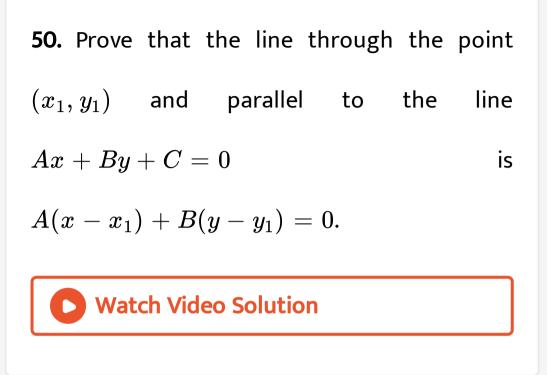
the line x - 7y + 5 = 0 and having x intercept

3.



49. The line through the points (h,3) and (4, 1) intersects the line 7x - 9y - 19 = 0 at right angle. Find the value of h.





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



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

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

54. 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.

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55. 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 $x \sec heta + y \cos e c heta = k$, respectively, prove

that $p^2+4q^2=k^2.$

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56. 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.

57. 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 $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

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58. Find the values of k for which the line $(k-3)x - \left(4-k^2\right)y + k^2 - 7k + 6 = 0$ is

Parallel to the x-axis.



59. Find the values of k for which the line $(k-3)x - (4-k^2)y + k^2 - 7k + 6 = 0$ is Parallel to the y-axis.

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60. Find the values of k for which the line $(k-3)x - \left(4-k^2\right)y + k^2 - 7k + 6 = 0$ is

Passing through the origin.

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

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

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

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

65. Find the equation of the line parallel to yaxis and drawn through the point of intersection of the lines x - 7y + 5 = 0 and 3x + y = 0.

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66. 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.

67. Find the area of the triangle formed by the

lines y-x = 0, x + y = 0 and x-k = 0.

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68. 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.

69. 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
 $m_1(c_2 - c_3) + m_2(c_3 - c_1) + m_3(c_1 - c_2) = 0$
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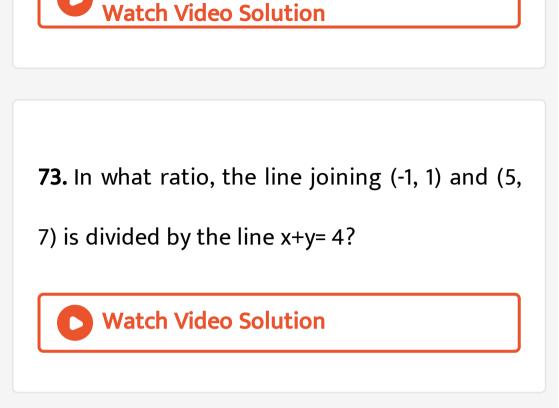
70. Find the equation of the lines through the point (3,2) which make an angle of 45° with the line x-2y=3.

71. 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.

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





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

75. 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.

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76. 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.



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



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



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

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

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81. 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.

82. 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 .

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83. 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.

