Perpendicular Lines

SCAN ME

REVISE THIS TOPIC

CHECK YOUR ANSWERS

SCAN ME

1 The equation of line $\mathbf{L_1}$ is $y = 5x + 1$
The equation of line $\mathbf{L_2}$ is $5y + x = 20$

Show that these two lines are perpendicular. **[3 marks]**

2 The equation of line $\mathbf{L_1}$ is $y = 8 - 3x$
The equation of line $\mathbf{L_2}$ is $9y - 3x - 6 = 0$

Show that these two lines are perpendicular. **[3 marks]**

6

3 The equation of line $\mathbf{L_1}$ is $2y = x + 10$
The equation of line $\mathbf{L_2}$ is $4y + 8x = 16$

Show that these two lines are perpendicular. **[3 marks]**

4 The equation of line $\mathbf{L_1}$ is $y = \frac{3}{4}x + 1$

The equation of line $\mathbf{L_2}$ is $6y + 8x = 30$

[3 marks]

Show that these two lines are perpendicular.

5 The equation of line $\mathbf{L_1}$ is $2y = 3x - 6$
The equation of line $\mathbf{L_2}$ is $8y - 12x - 40 = 0$

Show that these two lines are **not** perpendicular. **[3 marks]**

Solutions

6 The equation of line $\mathbf{L_1}$ is $y = kx + 4$
The equation of line $\mathbf{L_2}$ is $2y + 4x = 10$

Lines $\mathbf{L_1}$ and $\mathbf{L_2}$ are perpendicular. Work out the value of k. **[3 marks]**

$k =$ _____

7 The equation of line $\mathbf{L_1}$ is $2y = kx - 2$
The equation of line $\mathbf{L_2}$ is $3y + x = 18$

Lines $\mathbf{L_1}$ and $\mathbf{L_2}$ are perpendicular. Work out the value of k. **[3 marks]**

$k =$ _____

8 The equation of line $\mathbf{L_1}$ is $y = 3 - \frac{2}{5}x$
The equation of line $\mathbf{L_2}$ is $ky - 6x - 20 = 0$
Lines $\mathbf{L_1}$ and $\mathbf{L_2}$ are perpendicular. Work out the value of k. **[3 marks]**

$k =$ _____

18

Turn over ►

Solutions

9 Here are some equations of straight lines.
Match each equation on the left with one on the right so that the lines with those two equations are perpendicular.

One has been done for you.

[3 marks]

$y = 2x + 1$	$3y + 3x = 21$
$y = x + 8$	$y + \frac{1}{2}x = 7$
$y + 4x = 12$	$y = 4 - 3x$
$3y = x + 6$	$12y + 3x = 60$
$y - 4x - 10 = 0$	$2y = 8 + \frac{1}{2}x$

Solutions

10 The equation of line $\mathbf{L_1}$ is $y = 3x + 1$

Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (9, 4)

Work out an equation for line $\mathbf{L_2}$ **[3 marks]**

Answer _____

11 The equation of line $\mathbf{L_1}$ is $y = 5 - 4x$

Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (4, 12)

Work out an equation for line $\mathbf{L_2}$ **[3 marks]**

Answer _____

9

Solutions

12 The equation of line $\mathbf{L_1}$ is $y = \frac{1}{2}x + 3$

Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (-3, 7)

Work out an equation for line $\mathbf{L_2}$ **[3 marks]**

Answer _____

13 The equation of line $\mathbf{L_1}$ is $y = 2 - \frac{1}{6}x$

Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (2, 7)

Work out an equation for line $\mathbf{L_2}$ **[3 marks]**

Answer _____

Solutions

14 $A = (2, 6)$ $B = (1, 9)$ $C = (15, 2)$

Work out the equation of the line that
is perpendicular to line AB
and
passes through point C **[4 marks]**

Answer _____

15 $A = (0, 6)$ $B = (3, 8)$ $C = (6, 6)$

Work out the equation of the line that
is perpendicular to line AB
and
passes through point C **[4 marks]**

Answer _____

14

16 $A = (5, -3)$ $B = (3, 5)$ $C = (-5, 2)$

Work out the equation of the line that
is perpendicular to line AB
and
passes through point C **[4 marks]**

Answer _____

17 $A = (-4, 5)$ $B = (6, 1)$ $C = (-8, -9)$

Work out the equation of the line that
is perpendicular to line AB
and
passes through point C **[4 marks]**

Answer _____

Solutions

18 The equation of line $\mathbf{L_1}$ is $y = 3 - 2x$

Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (6, 2)

18 (a) Work out the coordinates of the point where line $\mathbf{L_2}$ intersects the x-axis.

[3 marks]

Answer (_____ , _____)

18 (b) Work out the coordinates of the point where line $\mathbf{L_2}$ intersects the y-axis.

[2 marks]

Answer (_____ , _____)

13

Solutions

19 The equation of line $\mathbf{L_1}$ is $y = 2x + 2$
Line $\mathbf{L_2}$ is

perpendicular to line $\mathbf{L_1}$

and

passes through the point (-8, 11)

Lines $\mathbf{L_1}$ and $\mathbf{L_2}$ intersect at the point P.
Line $\mathbf{L_1}$ intersects the x-axis at the point Q.
Line $\mathbf{L_2}$ intersects the x-axis at the point R.

Work out the area of triangle PQR.

[6 marks]

Answer _____ units^2

6

Solutions