Perpendicular Lines

SCAN ME

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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.

(Total for Question 1 is 2 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

(Total for Question 2 is 2 marks)

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.

(Total for Question 3 is 2 marks)

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

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

Show that these two lines are perpendicular.

(Total for Question 4 is 2 marks)

5 The equation of line $\mathbf{L_1}$ is $2y = 3x - 4$
The equation of line $\mathbf{L_2}$ is $8y - 12x - 40 = 0$

Show that these two lines are **not** perpendicular.

(Total for Question 5 is 2 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.

$k =$ .....

(Total for Question 6 is 2 marks)

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.

$k =$ .....

(Total for Question 7 is 2 marks)

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.

$k =$ .....

(Total for Question 8 is 2 marks)

9 The straight line **L** has the equation $y = 3x + 1$
The point A has coordinates (9, 4)

Find an equation of the straight line that is perpendicular to **L** and passes through A.

.....

(Total for Question 9 is 3 marks)

10 The straight line **L** has the equation $y = 5 – 4x$
The point A has coordinates (4, 12)

Find an equation of the straight line that is perpendicular to **L** and passes through A.

.....

(Total for Question 10 is 3 marks)

11 The straight line **L** has the equation $y = \frac{1}{2}x + 3$

The point A has coordinates (-3, 7)

Find an equation of the straight line that is perpendicular to **L** and passes through A.

.....

(Total for Question 11 is 3 marks)

12 The straight line **L** has the equation $y = 2 - \frac{1}{6}x$

The point A has coordinates (2, 7)

Find an equation of the straight line that is perpendicular to **L** and passes through A.

.....

(Total for Question 12 is 3 marks)

13 $A = (2, 6)$ $B = (1, 9)$ $C = (15, 2)$

Find an equation of the straight line that is perpendicular to AB and passes through C.

.....

(Total for Question 13 is 4 marks)

14 $A = (0, 6)$ $B = (3, 8)$ $C = (6, 6)$

Find an equation of the straight line that is perpendicular to AB and passes through C.

.....

(Total for Question 14 is 4 marks)

15 $A = (5, -3)$ $B = (3, 5)$ $C = (-5, 2)$

Find an equation of the straight line that is perpendicular to AB and passes through C.

.....

(Total for Question 15 is 4 marks)

16 $A = (-4, 5)$ $B = (6, 1)$ $C = (-8, -9)$

Find an equation of the straight line that is perpendicular to AB and passes through C.

.....

(Total for Question 16 is 4 marks)

Solutions

17 The straight line $\mathbf{L_1}$ has the equation $y = 3 - 2x$
The point A has coordinates (6, 2)

Line $\mathbf{L_2}$ is perpendicular to $\mathbf{L_1}$ and passes through A.

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

(..... , ...)

(3)

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

(..... , ...)

(2)

(Total for Question 17 is 5 marks)

18 The straight line $\mathbf{L_1}$ has the equation $y = 2x + 2$
The point A has coordinates (-8, 11)

Line $\mathbf{L_2}$ is perpendicular to $\mathbf{L_1}$ and passes through A.

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.

..... units^2

(Total for Question 18 is 6 marks)