

PARALLEL AND PERPENDICULAR LINES – PRACTICE QUESTIONS



1.

Write down the gradient of lines perpendicular to:

(a) $y = 3x + 10$

(b) $y = 4x - 11$

(c) $y = -2x + 7$

(d) $y = 10 - 7x$

(e) $y = \frac{1}{2}x - 4$

(f) $y = \frac{3}{4}x + 9$

(g) $y = -\frac{7}{2}x + \frac{1}{2}$

(h) $y = -\frac{4}{5}x - \frac{1}{5}$

(i) $2y = 5x - 10$

(j) $3y = 1 - x$

(k) $5y = 3x - 12$

(l) $9y = -8x + 13$

(m) $10y = 6x + 19$

(n) $2y = \frac{1}{5}x + 8$

(o) $3y = -\frac{3}{8}x + 12$

2.

Line L has equation $y = 2x + 11$.

(a) Circle the equation of the line that is parallel to L.

$$y = 3x + 11$$

$$y = 2x + 3$$

$$y = -\frac{1}{2}x + 9$$

$$y = \frac{1}{2}x - 5$$

(b) Circle the equation of the line that is perpendicular to L.

$$y = 3x + 11$$

$$y = 2x + 3$$

$$y = -\frac{1}{2}x + 9$$

$$y = \frac{1}{2}x - 5$$

3.

Line A has equation $y = \frac{3}{2}x + 9$.

(a) Circle the equation of the line that is parallel to A.

$$y = 2x + 5$$

$$y = -\frac{3}{2}x + 13$$

$$y = -\frac{2}{3}x + 11$$

$$y = \frac{3}{2}x - 2$$

(b) Circle the equation of the line that is perpendicular to A.

$$y = 2x + 5$$

$$y = -\frac{3}{2}x + 13$$

$$y = -\frac{2}{3}x + 11$$

$$y = \frac{3}{2}x - 2$$

4.

Line B has equation $y = 9 - 10x$.

(a) Circle the equation of the line that is parallel to B.

$$y = -10x + 11$$

$$y = -\frac{1}{10}x + 4$$

$$y = -\frac{1}{9}x + 7$$

$$y = \frac{1}{10}x - \frac{1}{9}$$

(b) Circle the equation of the line that is perpendicular to B.

$$y = -10x + 11$$

$$y = -\frac{1}{10}x + 4$$

$$y = -\frac{1}{9}x + 7$$

$$y = \frac{1}{10}x + 5$$

5.

Line C has equation $2y = 5x - 7$.

(a) Circle the equation of the line that is perpendicular to C.

$$y = -\frac{2}{5}x + 10$$

$$y = \frac{2}{5}x + 20$$

$$y = -\frac{5}{2}x + 11$$

$$y = \frac{5}{2}x + 9$$

(b) Circle the equation of the line that is parallel to C.

$$y = -\frac{2}{5}x + 10$$

$$y = \frac{2}{5}x + 20$$

$$y = -\frac{5}{2}x + 11$$

$$y = \frac{5}{2}x + 9$$

6.

Find the equation of the line that is parallel to $y = 3x + 10$ and passes through the point $(2, 11)$.

7.

Find the equation of the line that is perpendicular to $y = 4x - 1$ and passes through the point $(8, 5)$.

8.

Find the equation of the line that is parallel to $y = 6x + 6$ and passes through the point $(-1, 7)$.

9.

Find the equation of the line that is perpendicular to $y = \frac{3}{2}x + 3$ and passes through the point $(12, -1)$.

10.

Line A passes through the points $(1, 2)$ and $(5, 18)$.

Line B passes through the points $(7, 3)$ and $(9, 11)$.

Are lines A and B parallel, perpendicular or neither?

11.

Line C passes through the points $(2, 5)$ and $(6, 7)$.

Line D passes through the points $(8, 2)$ and $(5, -4)$.

Are lines C and D parallel, perpendicular or neither?

12.

Line E passes through the points $(7, 3)$ and $(10, -5)$.

Line F passes through the points $(-2, -1)$ and $(14, 5)$.

Are lines E and F parallel, perpendicular or neither?

13.

Below are the equations of five straight lines – A, B, C, D and E.

Line A $y = 4x - 9$

Line B $2y = 4x + 11$

Line C $4y = 15 - x$

Line D $3y = 2x + 5$

Line E $y = \frac{2}{3}x$

(a) Write down the letters of the two lines that are parallel.

(b) Write down the letters of the two lines that are perpendicular.

14.

Below are the equations of five straight lines – M, N, O, P and Q.

Line M $y = 3x + 5$

Line N $2y + 5x - 10 = 0$

Line O $3y + x - 3 = 0$

Line P $4y - 10x - 5 = 0$

Line Q $y = -\frac{5}{2}x + 1$

(a) Write down the letters of the two lines that are parallel.

(b) Write down the letters of the two lines that are perpendicular.

15.

Line Z passes through the points (1, 5) and (5, 17).

Line Q is parallel to Line Z and passes through the point (4, 2).

Find the equation of Line Q.

16.

Line R passes through the points (2, 3) and (5, -6).

Line Q is perpendicular to Line R and passes through the point (6, 10).

Find the equation of Line Q.

17.

Line S passes through the points (3, 1) and (6, -3).

Line T is parallel to Line S and passes through the point (15, 6).

Find the equation of Line T.

18.

$$A = (-2, -4)$$

$$B = (3, 0)$$

$$C = (12, 3)$$

Find the equation of the line perpendicular to AB that passes through point C.

19.

$$X = (3, 10)$$

$$Y = (-5, 8)$$

$$Z = (5, 5)$$

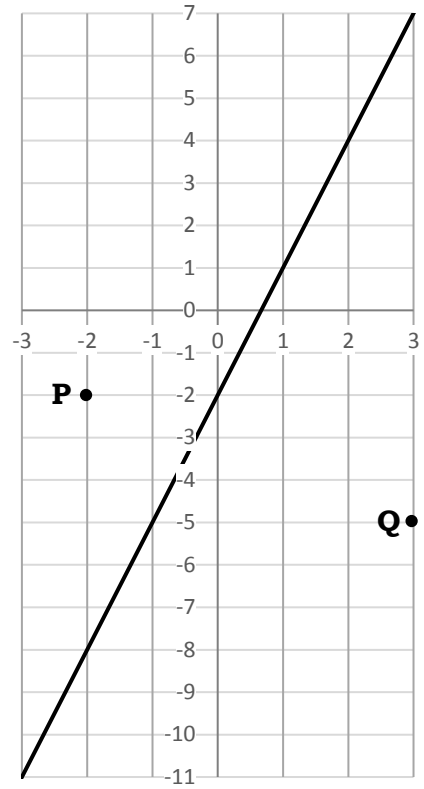
Find the equation of the line perpendicular to XZ that passes through point Y.

20.

Pictured to the right is a straight line L and points P and Q.

(a) Find the equation of the line L.

(b) Find the equation of the line that is parallel to L and passes through P.



(c) Find the equation of the line that is perpendicular to L and passes through Q.

21.

The line W has equation $3y = 4x - 11$.

The line V is perpendicular to W and passes through the point $(-4, 7)$.

Does V pass through the point $(\frac{2}{3}, \frac{7}{2})$?

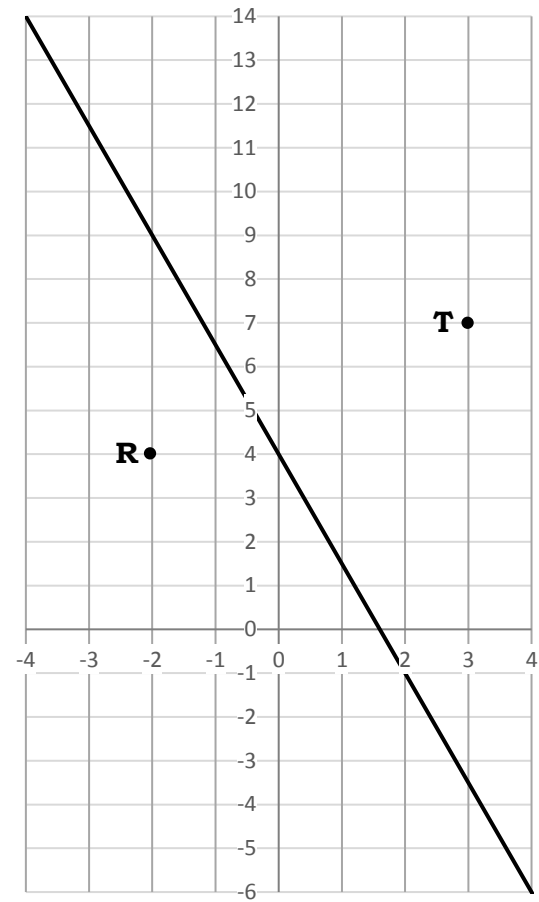
22.

Pictured to the right is the straight line S_1 and the points R and T.

(a) Find the equation of S_1 .

(b) S_2 is perpendicular to S_1 and passes through R.
Find the equation of S_2 .

(c) Does S_2 pass through T?



23.

$$A = (-3, -2)$$

$$B = (6, 4)$$

The line C has equation $4y + 6x = 13$.

Show that C is perpendicular to AB.

24.

Line I passes through the points (5, 6) and (8, -3).

Line J passes through the points (-2, -2) and (4, k).

Lines I and J are perpendicular.

Find k.

25.

Line F crosses the y-axis at $y = 5$ and crosses the x-axis at $x = 2$.

Line G passes through the points $(1, \frac{12}{5})$ and $(m, 4)$.

Lines F and G are perpendicular.

Find m.