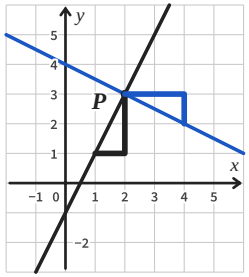
Perpendicular lines: the gradient

ANSWERS

1

Draw the line through P perpendicular to the line shown. Write its gradient.



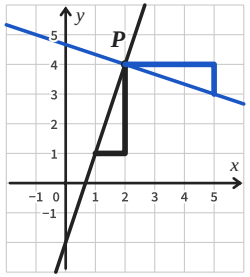
across 1, up 2

across 2, down 1

Gradient $-\frac{1}{2}$

2

Draw the line through P perpendicular to the line shown. Write its gradient.



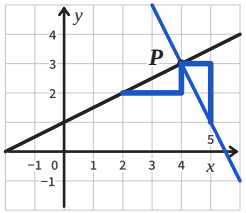
across 1, up 3

across 3, down 1

Gradient $-\frac{1}{3}$

3

Draw the line through P perpendicular to the line shown. Write its gradient.



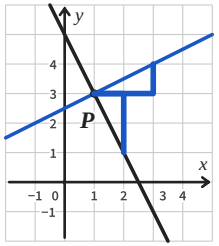
across 2, up 1

across 1, down 2

Gradient -2

4 *Notice the change!*

Draw the line through P perpendicular to the line shown. Write its gradient.



across 1, down 2

across 2, up 1

Gradient $\frac{1}{2}$

5

Find the gradient of a line perpendicular to $y = 4x + 1$.

$m = 4$

$-1 \div 4 = -\frac{1}{4}$

$4 \times -\frac{1}{4} = -1$

Gradient $-\frac{1}{4}$

6

Find the gradient of a line perpendicular to $y = -5x + 2$.

$m = -5$

$-1 \div (-5) = \frac{1}{5}$

$-5 \times \frac{1}{5} = -1$

Gradient $\frac{1}{5}$

7

Find the gradient of a line perpendicular to $y = \frac{1}{3}x - 2$.

$m = \frac{1}{3}$

$-1 \div \frac{1}{3} = -3$

$\frac{1}{3} \times -3 = -1$

Gradient -3

8

Are $y = 2x + 3$ and $y = -\frac{1}{2}x + 1$ perpendicular?

Show how you know.

$2 \times -\frac{1}{2} = -1$

Answer Yes

Perpendicular lines: the gradient *further practice*

ANSWERS

9

Find the gradient of a line perpendicular to $y = 6x - 1$.

$-1 \div 6 = -\frac{1}{6}$

$6 \times -\frac{1}{6} = -1$

Answer $-\frac{1}{6}$

10

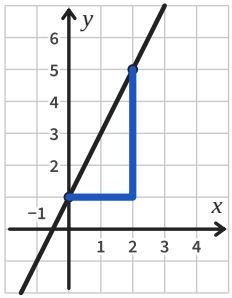
Find the gradient of a line perpendicular to $y = 3 - 2x$.

$m = -2$, $-1 \div (-2) = \frac{1}{2}$

Answer $\frac{1}{2}$

11

Find the gradient of a line perpendicular to the line on the grid.



up 4, across 2: $m = 2$

$-1 \div 2 = -\frac{1}{2}$

Answer $-\frac{1}{2}$

12

Find the two pairs of perpendicular lines.

A $y = 3x + 1$ **B** $y = -3x$

C $y = -\frac{1}{3}x + 2$ **D** $y = \frac{1}{3}x$

$3 \times -\frac{1}{3} = -1$

$-3 \times \frac{1}{3} = -1$

Answer A and C; B and D

13

Find the gradient of a line perpendicular to $y = \frac{2}{3}x + 1$.

$-1 \div \frac{2}{3} = -\frac{3}{2}$

$\frac{2}{3} \times -\frac{3}{2} = -1$

Answer $-\frac{3}{2}$

14

A is (1, 2) and B is (3, 8).
Find the gradient of a line perpendicular to AB.

gradient of AB $= 6 \div 2 = 3$

$-1 \div 3 = -\frac{1}{3}$

Answer $-\frac{1}{3}$

15

On a plan of a park, a path follows the line $y = \frac{1}{4}x + 3$. A new path will cross it at right angles. What is the gradient of the new path?

$-1 \div \frac{1}{4} = -4$

$\frac{1}{4} \times -4 = -1$

Answer -4

16

Jo says $y = 5x + 2$ and $y = -5x + 2$ are perpendicular, because the gradients have opposite signs.
Is Jo right? Explain.

$5 \times -5 = -25$, not -1

perpendicular to 5 is $-\frac{1}{5}$

Answer No