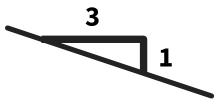
Perpendicular lines: the gradient

Exit ticket ANSWERS Name _____

1. The step on this line goes across 3 and down 1. Find the gradient of a line perpendicular to it.



3

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

$\frac{1}{6}$

3. Are $y = \frac{1}{4}x + 3$ and $y = 4x - 1$ perpendicular?
Show how you know.

No: $\frac{1}{4} \times 4 = 1$, not -1

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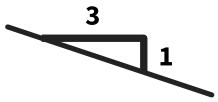

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TESTS The perpendicular gradient from a step: the step turned a quarter turn

LOOK FOR

−3 the step turned but still going down: across 1, up 3 gives 3

$\frac{1}{3}$ the step not turned: across 3 and down 1 swap to across 1 and up 3

FIX IT

A line has the step across 2, up 1. Turn the step a quarter turn. What is the new gradient? *−2*

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

$\frac{1}{6}$

TESTS The perpendicular gradient: −1 ÷ m

LOOK FOR

6 the sign changed but not flipped: $-1 \div (-6) = \frac{1}{6}$

$-\frac{1}{6}$ flipped but the sign kept: it changes too

FIX IT

Find the gradient of a line perpendicular to $y = -2x + 5$. $\frac{1}{2}$

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3 **Are $y = \frac{1}{4}x + 3$ and $y = 4x - 1$ perpendicular? Show how you know.**

No: $\frac{1}{4} \times 4 = 1$, not −1

TESTS Testing two lines: the gradients multiply to make −1

LOOK FOR

Yes one gradient is the other flipped, but the sign did not change: $\frac{1}{4} \times 4 = 1$

FIX IT

Are $y = 3x + 2$ and $y = -\frac{1}{3}x$ perpendicular? Show how you know. *Yes: $3 \times -\frac{1}{3} = -1$*