

Straight Line Graphs

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Find the gradient of the line through (1, 3) and (4, 9).

Step 1 · Change in y

$$9 - 3 = 6$$

Step 2 · Change in x

$$4 - 1 = 3$$

Step 3 · Divide

$$6 \div 3 = 2$$

Answer: Gradient = 2

Check: Going 1 right always means going 2 up: (2, 5), (3, 7), (4, 9) ✓

2. Now try one with the steps

For $y = 3x - 2$, state the gradient and y-intercept, and find where it crosses the x-axis.

Step 1 · Compare with $y = mx + c$

Step 2 · x-axis: put $y = 0$

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Write down the gradient of $y = 5x + 1$. [1]

2. Find the gradient of the line through (0, 2) and (3, 14). [2]

3. Find the gradient of the line through $(-1, 4)$ and $(3, -4)$. [2]

4. Write the equation of the line with gradient 3 that crosses the y-axis at $(0, -5)$. [1]

5. Does the point (2, 7) lie on the line $y = 4x - 1$? Show how you know. [1]

6. Find where the line $y = 2x - 6$ crosses the x-axis. [2]

7. Write the equation of the line parallel to $y = 4x + 1$ that passes through (0, -3). [2]

8. Find the equation of the line with gradient 2 through the point (1, 5). [2]

9. Find the equation of the line through (2, 1) and (4, 7). [3]

10. Find the equation of the line through (-2, 6) and (2, -2). [3]

11. Find the gradient of the line $3x + 2y = 8$. [2]

12. Are the lines $y = 2x + 3$ and $4x - 2y = 5$ parallel? Explain. [2]

13. Find the midpoint of (2, 7) and (8, -1). [2]

14. Find the equation of the line through (3, -1) that is parallel to $2x + y = 7$. [3]

15. A taxi charges £3 plus £1.50 per mile. Write the cost C (in £) in terms of the number of miles m , and say what the gradient means. [2]
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4. Before you hand it in

Gradient through (1, 3) and (4, 9) = $3 \div 6 = 0.5$

Gradient is 'up over along': change in $y \div$ change in $x = 6 \div 3 = 2$.

Gradient through (-1, 4) and (3, -4) = -2

$(-4 - 4) = -8$ and $3 - (-1) = 4$, so $-8 \div 4 = -2$. The line slopes downhill.

$2x + 3y = 12$ has gradient -2/3

Rearrange to $y = -(2/3)x + 4$ first. The gradient is $-2/3$.

Line through (2, 5) with gradient -2: $y = -2x + 9$

c is where $x = 0$, not the y of any point. Substitute: $5 = -2(2) + c$, so $c = 9$.