

Coordinates Straight Line Graphs

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Plot $y = 2x + 1$ for x from -2 to 2 .

Step 1 · Build a table of values substituting $x = -2, -1, 0, 1, 2$

$x: -2, -1, 0, 1, 2 \rightarrow y: -3, -1, 1, 3, 5$

Step 2 · Plot the points on a grid

$(-2, -3), (-1, -1), (0, 1), (1, 3), (2, 5)$

Step 3 · Draw a straight line through all five points

Gradient = 2, y-intercept = 1

Answer: Straight line through $(0, 1)$ with gradient 2

Check: Point $(1, 3)$: $y = 2(1) + 1 = 3$ ✓

2. Now try one with the steps

Find the gradient and y-intercept of $y = -3x + 4$.

Step 1 · Compare with $y = mx + c$

Step 2 · Gradient is negative so line slopes downward

Answer:

3. Practice

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

1. What is the gradient and y-intercept of $y = 5x - 2$? [2]

2. Complete the table for $y = 3x - 1$ when $x = 0, 1, 2, 3$. [2]

3. Which line is steeper: $y = 4x + 1$ or $y = -6x + 2$? [2]

4. A line has gradient 3 and passes through $(0, -5)$. Write its equation. [2]

5. Find the equation of the line through (0, 4) and (2, 10). [3]

6. Do the points (1, 5), (3, 11), (5, 17) lie on the line $y = 3x + 2$? [3]

7. Find the midpoint of the points (2, 4) and (8, 10). [2]

8. Find y when $x = 4$ on the line $y = 2x - 3$. [1]

9. What is the gradient of $y = 7 - 2x$? [1]

10. Find the gradient of the line through (1, 2) and (4, 14). [2]

11. Does the point (3, 10) lie on the line $y = 4x - 1$? [2]

12. Where does the line $y = 4x - 8$ cross the x -axis? [2]

13. Write $2y = 6x + 8$ in the form $y = mx + c$. [2]

14. Write the equation of the line parallel to $y = 2x + 5$ that passes through (0, -1). [2]

15. Find the gradient of the line through $(-2, 5)$ and $(4, -7)$. [2]

16. Find the equation of the line through $(2, 7)$ and $(5, 13)$. [3]

4. Before you hand it in

Reading gradient and y-intercept in $y = mx + c$

In $y = mx + c$, m is ALWAYS the number in front of x (the gradient). c is ALWAYS the standalone number (the y-intercept).

Thinking a negative gradient means the line is below the x-axis

A negative gradient means the line slopes downward (left to right). The line can still be above the x-axis.

Joining plotted points with a curved line or zigzag

Use a ruler. If the points don't align exactly, recheck the table values — a straight line equation always gives collinear points.