Your notes

KS3 Maths: revision notes

Coordinates and graphs

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Coordinates

- A coordinate (x, y) gives the position of a point: go along the **x-axis** first, then up or down the **y-axis** ("along the corridor, then up the stairs").
- There are four **quadrants**, so **coordinates** can be negative, such as (–3, 4).
- The **midpoint** of (2, 3) and (8, 7) is found by averaging: ((2 + 8) ÷ 2, (3 + 7) ÷ 2) = (5, 5).

Straight lines

- x = 3 is a vertical line. y = 2 is a horizontal line. y = x is a diagonal line through the **origin**.
- A straight-line graph has an equation y = mx + c: m is the **gradient** (steepness) and c is the **y-intercept** (where it crosses the **y-axis**).
- y = 2x + 1 has a **gradient** of 2 and crosses the **y-axis** at (0, 1). Lines with the same **gradient** are parallel.
- **Gradient** = change in y ÷ change in x. The line through (1, 2) and (3, 8) has a **gradient** of 6 ÷ 2 = 3.

Drawing graphs

- Make a table of values. For y = 2x + 1: when x = 0, y = 1; when x = 1, y = 3; when x = 2, y = 5. Plot the points and join them with a ruler.
- To check if a point is on a line, substitute its x-value: (3, 5) is on y = x + 2, because 3 + 2 = 5.

Real-life graphs

- Conversion graphs change one unit into another, such as miles into kilometres.
- On a distance-time graph, a steeper line means a faster speed and a flat line means the object has stopped.

Key terms

Coordinates	A pair of numbers (x, y) that give the position of a point.
x-axis	The horizontal axis.
y-axis	The vertical axis.
Origin	The point (0, 0), where the axes cross.
Quadrant	One of the four regions made by the axes.
Midpoint	The point exactly halfway between two points.
Gradient	The steepness of a line: change in y ÷ change in x.
y-intercept	Where a line crosses the y-axis.
Parallel	Lines that never meet because they have the same gradient.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which of these points is on the x-axis?
2. What is the midpoint of (2, 3) and (8, 7)?
3. What type of line is x = 3?
4. What is the gradient of y = 2x + 1?
5. Where does y = 3x – 4 cross the y-axis?
6. For y = 2x + 1, what is y when x = 3?
7. Which of these lines is the steepest?
8. Which point lies on the line y = x + 2?

Answers

1. (4, 0)
2. (5, 5)
3. A vertical line
4. 2
5. (0, –4)
6. 7
7. y = 5x + 1
8. (3, 5)

What to do next

Practise 12 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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