

Name _____

Date _____

Unit 11 · Graphs — revision sheet

Everything you need from every section. Read it before the end-of-unit test.

11.1 Coordinates

- Coordinates are written **(x, y)** — always across first, then up or down.
- The **origin** is (0, 0), where the two axes cross.
- The axes divide the plane into **four quadrants**, numbered anticlockwise from the top right.
- Quadrant 1 (+, +), quadrant 2 (−, +), quadrant 3 (−, −), quadrant 4 (+, −).
- A point with $x = 0$ lies on the **y-axis**; a point with $y = 0$ lies on the **x-axis**.
- Points with the same y-coordinate lie on a **horizontal** line; same x-coordinate gives a **vertical** line.
- The distance between two points on the same horizontal line is the difference in their x-coordinates.
- The **midpoint** is found by averaging the x-coordinates and averaging the y-coordinates.

Key words: coordinates · x-coordinate · y-coordinate · origin · axis · quadrant · midpoint

(3, 2) 3 across, 2 up
 (3, −2) 3 across, 2 down
 (3, 5) and (5, 3) are different points
 (0, 4) on the y-axis
 (−3, 0) on the x-axis
 (0, 0) the origin itself
 1 (+, +) top right

11.2 Straight-line graphs

- A straight line has the rule **$y = mx + c$** .
- **m is the gradient**: how much y changes for every 1 that x increases.
- **c is the y-intercept**: where the line crosses the y-axis, found by putting $x = 0$.
- To plot a line: make a small table of values, plot the points, then join them with a ruler.
- Two points fix a line, but always plot a **third as a check**.
- A **negative** gradient means the line goes down from left to right.
- **$y = 4$** is horizontal; **$x = -2$** is vertical. Neither is of the form $y = mx + c$.
- Lines with the same gradient are **parallel** and never meet.

Key words: gradient · y-intercept · straight-line graph · table of values · plot · parallel

$y = 2x + 1$
 x: 0 1 2 3
 y: 1 3 5 7
 plot (0,1) (1,3) (2,5) (3,7)
 $y = x$ up 1 for each 1 across
 $y = 3x$ up 3 for each 1 across — steeper
 $y = -2x$ down 2 for each 1 across

11.3 Reading real-life graphs

- Before reading anything, check **what each axis shows** and **what one square is worth**.
- A **conversion graph** goes through the origin, because 0 of one unit is 0 of the other.
- A graph with a **fixed charge** does not start at the origin — the intercept is that charge.
- On a **distance-time** graph, the gradient is the **speed**.
- A **steeper** line means faster; a **flat** section means stopped.
- A line going **down** means returning towards the start.
- **Average speed = total distance ÷ total time.**
- Read from the graph carefully: on a large scale, one square out is a big error.

Key words: conversion graph · distance-time graph · rate · scale · average speed

x-axis: time in hours, 1 square = 30 min
y-axis: distance in km, 1 square = 20 km
5 miles = 8 km
so 20 miles = 32 km
and 40 km = 25 miles
taxi: $y = 2x + 5$
0 km still costs 5