

Name _____

Date _____

11.3 Reading real-life graphs — worksheet

Read and interpret conversion graphs and distance-time graphs, including what the gradient represents. · 40 questions · Show your working.

Remember

- 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.

A · Fluency — Rates, conversions and gradients.

- 1 A conversion graph shows 8 km per litre. What does 5 give?

- 2 A conversion graph shows 60 km per hour. What does 3 give?

- 3 A conversion graph shows 12 pages per minute. What does 7 give?

- 4 A conversion graph shows 250 grams per cup. What does 4 give?

- 5 A conversion graph shows 15 litres per minute. What does 6 give?

- 6 A conversion graph shows 45 words per minute. What does 8 give?

- 7 A straight-line graph passes through the origin and reaches 120 at 15. What is the value at 1?

- 8 A straight-line graph passes through the origin and reaches 180 at 3. What is the value at 1?

- 9 A straight-line graph passes through the origin and reaches 84 at 7. What is the value at 1?

- 10 A straight-line graph passes through the origin and reaches 1000 at 4. What is the value at 1?

- 11 A straight-line graph passes through the origin and reaches 90 at 6. What is the value at 1?

- 12 A straight-line graph passes through the origin and reaches 360 at 8. What is the value at 1?

13 A graph goes through the origin and (4, 20). What is its gradient?

14 A graph goes through the origin and (3, 12). What is its gradient?

15 A graph goes through the origin and (6, 30). What is its gradient?

16 A graph goes through the origin and (5, 15). What is its gradient?

17 A graph goes through the origin and (2, 14). What is its gradient?

18 A graph goes through the origin and (8, 24). What is its gradient?

B · Reasoning — What the shape of a graph tells you.

19 What does a horizontal section of a distance–time graph mean?

- ☐ Moving quickly
- ☐ Moving slowly
- ☐ Not moving at all
- ☐ Moving backwards

20 On a distance–time graph, what does a steeper line mean?

- ☐ Slower
- ☐ Faster
- ☐ Stopped
- ☐ Going back

21 Why does a conversion graph go through the origin?

- ☐ It always does
- ☐ Because 0 of one unit is 0 of the other
- ☐ To look tidy
- ☐ It does not

22 A taxi graph starts at (0, 3). What does the 3 represent?

- ☐ The speed
- ☐ The fixed charge before you travel
- ☐ The distance
- ☐ Nothing

23 What is the gradient of a distance–time graph?

- ☐ The distance
- ☐ The time
- ☐ The speed
- ☐ The starting point

24 Can a distance–time graph go downwards?

- ☐ Yes
- ☐ No

25 Why should you read values from a graph carefully rather than guessing?

- ☐ Graphs are decorative
- ☐ Small reading errors change the answer a lot when the scale is large
- ☐ Graphs are always wrong
- ☐ You should guess

26 What must you always check before reading a graph?

- ☐ The colour
- ☐ What each axis shows and what one square is worth
- ☐ The title only
- ☐ Nothing

C · Challenge — Speeds, and working backwards.

27 A journey graph shows 150 km in 2 hours. What is the average speed, in km/h?

28 A cyclist covers 24 km in 90 minutes. What is the speed, in km per hour?

29 A conversion graph shows 5 miles = 8 km. How many km is 20 miles?

30 A conversion graph shows 5 miles = 8 km. How many miles is 40 km?

31 A taxi graph is $y = 2x + 5$. A fare was 27 dollars. How far was the journey, in km?

32 A tank empties at 4 litres a minute from 100 litres. After how many minutes is it empty?

D · Word problems — Journeys, taps and printers.

33 A car travels 240 km in 3 hours. What is its average speed, in km/h?

34 A walker covers 12 km in 3 hours. What is the speed, in km/h?

35 A graph converts 1 kg to 2.2 pounds. How many pounds is 5 kg?

36 A phone charges 20% in 15 minutes at a steady rate. How long for 100%, in minutes?

37 A printer prints 12 pages a minute. How many pages in 9 minutes?

38 A tap fills 15 litres a minute. How long to fill 180 litres, in minutes?

39 A train travels at 90 km/h. How far in 4 hours, in km?

- 40** A journey graph is flat for 20 minutes in the middle. How far did the traveller move in that time, in km?
