

Name _____

Date _____

11.3 Reading real-life graphs — worked answers

Read and interpret conversion graphs and distance–time graphs, including what the gradient represents. · 40 questions

A · Fluency — Rates, conversions and gradients.

- 1 A conversion graph shows 8 km per litre. What does 5 give?
Answer: 40
 $8 \times 5 = 40.$
- 2 A conversion graph shows 60 km per hour. What does 3 give?
Answer: 180
 $60 \times 3 = 180.$
- 3 A conversion graph shows 12 pages per minute. What does 7 give?
Answer: 84
 $12 \times 7 = 84.$
- 4 A conversion graph shows 250 grams per cup. What does 4 give?
Answer: 1000
 $250 \times 4 = 1000.$
- 5 A conversion graph shows 15 litres per minute. What does 6 give?
Answer: 90
 $15 \times 6 = 90.$
- 6 A conversion graph shows 45 words per minute. What does 8 give?
Answer: 360
 $45 \times 8 = 360.$
- 7 A straight-line graph passes through the origin and reaches 120 at 15. What is the value at 1?
Answer: 8
 $120 \div 15 = 8.$
- 8 A straight-line graph passes through the origin and reaches 180 at 3. What is the value at 1?
Answer: 60
 $180 \div 3 = 60.$
- 9 A straight-line graph passes through the origin and reaches 84 at 7. What is the value at 1?
Answer: 12
 $84 \div 7 = 12.$

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

Answer: 250

$$1000 \div 4 = 250.$$

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

Answer: 15

$$90 \div 6 = 15.$$

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

Answer: 45

$$360 \div 8 = 45.$$

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

Answer: 5

$20 \div 4 = 5$. That is the rate the graph describes.

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

Answer: 4

$12 \div 3 = 4$. That is the rate the graph describes.

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

Answer: 5

$30 \div 6 = 5$. That is the rate the graph describes.

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

Answer: 3

$15 \div 5 = 3$. That is the rate the graph describes.

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

Answer: 7

$14 \div 2 = 7$. That is the rate the graph describes.

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

Answer: 3

$24 \div 8 = 3$. That is the rate the graph describes.

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

Answer: Not moving at all

Time passes but distance does not change.

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

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

Answer: Faster

More distance covered in the same time.

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

Answer: Because 0 of one unit is 0 of the other

Zero kilometres is zero miles. A graph with a fixed charge, such as a taxi fare, does not start at the origin.

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

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

Answer: The fixed charge before you travel

You pay it even for a journey of zero kilometres.

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

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

Answer: The speed

Distance divided by time is speed.

24 Can a distance–time graph go downwards?

- ☐ Yes
- ☐ No

Answer: Yes

It means returning towards the start — the distance from home is decreasing.

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

Answer: Small reading errors change the answer a lot when the scale is large

One square might be 50 units.

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

Answer: What each axis shows and what one square is worth

The scale is where most marks are lost.

C · Challenge — Speeds, and working backwards.

- 27** A journey graph shows 150 km in 2 hours. What is the average speed, in km/h?
Answer: 75
 $150 \div 2 = 75$ km/h.
- 28** A cyclist covers 24 km in 90 minutes. What is the speed, in km per hour?
Answer: 16
90 minutes is 1.5 hours, and $24 \div 1.5 = 16$ km/h.
- 29** A conversion graph shows 5 miles = 8 km. How many km is 20 miles?
Answer: 32
 $20 \div 5 = 4$, and $8 \times 4 = 32$ km.
- 30** A conversion graph shows 5 miles = 8 km. How many miles is 40 km?
Answer: 25
 $40 \div 8 = 5$, and $5 \times 5 = 25$ miles.
- 31** A taxi graph is $y = 2x + 5$. A fare was 27 dollars. How far was the journey, in km?
Answer: 11
 $2x + 5 = 27$, so $2x = 22$ and $x = 11$.
- 32** A tank empties at 4 litres a minute from 100 litres. After how many minutes is it empty?
Answer: 25
 $100 \div 4 = 25$.

D · Word problems — Journeys, taps and printers.

- 33** A car travels 240 km in 3 hours. What is its average speed, in km/h?
Answer: 80
 $240 \div 3 = 80$.
- 34** A walker covers 12 km in 3 hours. What is the speed, in km/h?
Answer: 4
 $12 \div 3 = 4$.
- 35** A graph converts 1 kg to 2.2 pounds. How many pounds is 5 kg?
Answer: 11
 $2.2 \times 5 = 11$.
- 36** A phone charges 20% in 15 minutes at a steady rate. How long for 100%, in minutes?
Answer: 75
 $15 \times 5 = 75$.
- 37** A printer prints 12 pages a minute. How many pages in 9 minutes?
Answer: 108
 $12 \times 9 = 108$.
- 38** A tap fills 15 litres a minute. How long to fill 180 litres, in minutes?
Answer: 12
 $180 \div 15 = 12$.
- 39** A train travels at 90 km/h. How far in 4 hours, in km?
Answer: 360
 $90 \times 4 = 360$.

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

Answer: 0

A flat section means no movement at all.