Real-Life Graphs: exam questions

10 questions · 30 marks · mark schemes at the end

Name _____ Date _____ Score / 30

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/real-life-graphs

1. **2 marks**

A cyclist leaves town A at 9:00 am and arrives at town B, 24 km away, at 10:30 am.

Work out her average speed in km/h.

2. **2 marks**

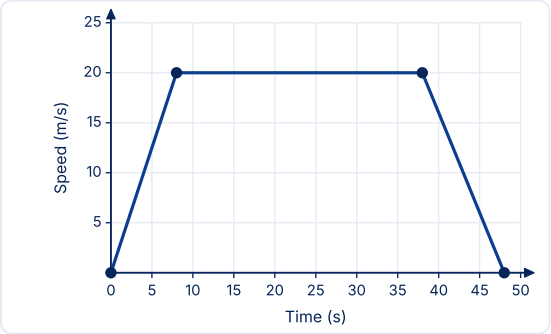
A car starts from rest and accelerates uniformly to 20 m/s in 8 seconds.

Work out the acceleration of the car.

3. **3 marks**

A car starts from rest and accelerates uniformly to 20 m/s in 8 seconds. It then travels at 20 m/s for 30 seconds. It then slows down uniformly and stops after a further 10 seconds.

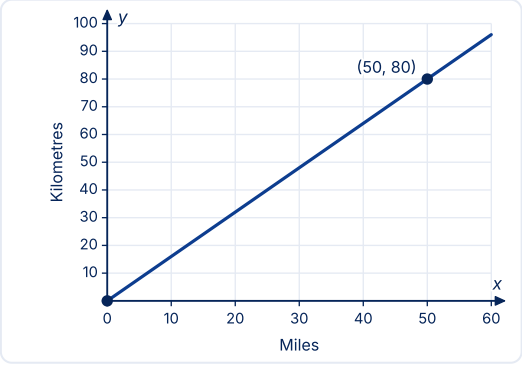
Use the area under the speed–time graph to work out the total distance travelled.



4. **2 marks**

A straight-line conversion graph between miles and kilometres passes through $(0, 0)$ and $(50, 80)$, where x is in miles and y is in kilometres.

Use the graph's equation to change 35 miles into kilometres.



5. **3 marks**

A phone plan costs £12 each month plus 5p for each minute of calls.

(a) Write down a formula for the monthly cost, C pounds, when m minutes of calls are made. **(2)**

(b) Work out the cost in a month when 300 minutes of calls are made. **(1)**

6. **4 marks**

A train starts from rest and accelerates uniformly to 25 m/s in 40 seconds. It travels at 25 m/s for 2 minutes. It then slows down uniformly and stops after a further 50 seconds.

Work out the total distance travelled by the train.

7. **4 marks**

Kai leaves home at 08:00. He cycles 12 km and arrives at 08:40. He stops for 20 minutes. He then cycles a further 18 km and arrives at 10:00.

(a) Work out his speed for the first 12 km in km/h. **(2)**

(b) Work out his average speed for the whole time from 08:00 to 10:00. **(2)**

8. **4 marks**

A bus slows down uniformly from 15 m/s to 3 m/s in 6 seconds.

(a) Work out the deceleration of the bus. **(2)**

(b) Work out the distance travelled by the bus in these 6 seconds. **(2)**

9. **3 marks**

Temperatures in degrees Celsius (C) and degrees Fahrenheit (F) are related by a straight-line graph. $0°$ C is $32°$F and $100°$C is $212°$F.

Change $25°$C into degrees Fahrenheit.

10. **3 marks**

A car accelerates uniformly from 4 m/s to 16 m/s. It travels 120 m while doing so.

Work out the time taken.

Answers and worked solutions

Question 1 — 2 marks

M1 $24 \div 1.5$

A1 $16\,\text{km/h}$

Answer: $16\,\text{km/h}$

Question 2 — 2 marks

M1 $20 \div 8$

A1 $2.5\,\text{m/s}^2$

Answer: $2.5\,\text{m/s}^2$

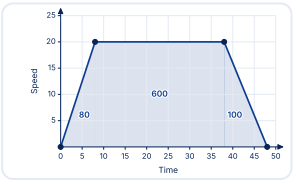
Question 3 — 3 marks

M1 one area correct:
$\frac{1}{2} \times 8 \times 20 = 80$,
$30 \times 20 = 600$ or
$\frac{1}{2} \times 10 \times 20 = 100$

M1 $80 + 600 + 100$

A1 780 m

Answer: 780 m

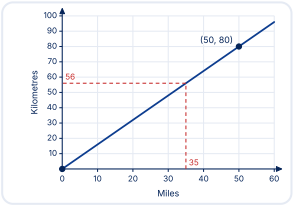


Question 4 — 2 marks

M1 gradient $\frac{80}{50} = 1.6$

A1 56 km

Answer: 56 km



Question 5 — 3 marks

(a)

B1 $0.05m$ (or $5m$ in pence)

B1 $C = 12 + 0.05m$

(b)

B1 £27

Answer: (a) $C = 12 + 0.05m$; (b) £27

Question 6 — 4 marks

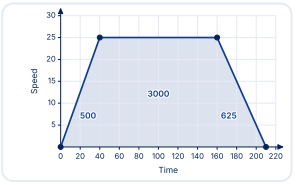
M1 $\frac{1}{2} \times 40 \times 25 = 500$

M1 $120 \times 25 = 3000$

M1 $\frac{1}{2} \times 50 \times 25 = 625$

A1 4125 m

Answer: 4125 m



Question 7 — 4 marks

(a)

M1 $12 \div \frac{40}{60}$

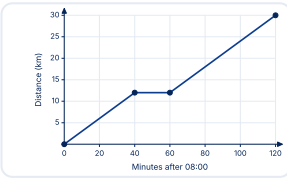
A1 $18\,\text{km/h}$

(b)

M1 $30 \div 2$

A1 $15\,\text{km/h}$

Answer: (a) $18\,\text{km/h}$; (b) $15\,\text{km/h}$



Question 8 — 4 marks

(a)

M1 $(15 - 3) \div 6$

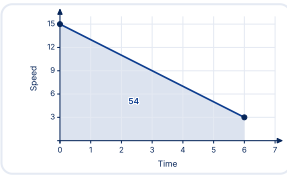
A1 $2\,\text{m/s}^2$

(b)

M1 $\frac{1}{2}(15 + 3) \times 6$

A1 54 m

Answer: (a) $2\,\text{m/s}^2$; (b) 54 m



Question 9 — 3 marks

M1 gradient $\frac{212 - 32}{100} = 1.8$

M1 $32 + 1.8 \times 25$

A1 $77°F$

Answer: $77°F$

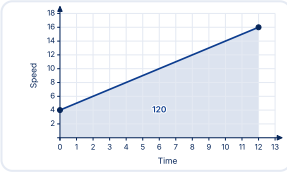
Question 10 — 3 marks

M1 area of trapezium:
$\frac{1}{2}(4 + 16)t = 120$

M1 $10t = 120$

A1 12 seconds

Answer: 12 seconds



Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/real-life-graphs
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