Mark schemes

Q1.

Valid criticism referring to the line from (0, 0) to (10, 1)

eg there shouldn't be a curve
need to be specific about the line shape, it is not sufficient to simply say it is wrong

B1

Valid criticism referring to the line from (15, 1)

oe
eg he never goes 2 km from home

B1

Additional Guidance

Criticisms can be in either order

A correct diagram takes precedence over statements, otherwise ignore diagram

For first B1:

The first part is curved

B1

The curve should be a straight line

B1

He has drawn a curve for constant speed

B1

The line is curved which shows his speed was not consistent/constant

B1

He's not going at a constant speed to the shop (correct referral to graph)

B1

All lines should be straight

B1

Constant speed should be a diagonal/straight line

B1

The line shouldn't curve

B1

The constant speed should be

B1

The curved line shows he decreased speed

B1

It should be a straight line from 0 to 10

B1

It should be a straight line at the start

B1

A distance-time graph shouldn't have curves

B0

It should be a straight line ('It' seems to be referring to the whole graph)

B0

The curved line shows he increased and decreased speed

B0

He was walking at a range of speeds, so not consistent   (referral to whole graph)

B0

The constant speed is drawn incorrectly   (how?)

B0

The lines should be curved or straight, not both

B0

The curve should be a line of best fit

B0

It should be a straight line from 0 to 15   (it should be to 10)

B0

The curve is wrong   (how?)

B0

For 2nd B1:

The line should go down at the end

B1

He isn't walking home, he's walking further away

B1

He has walked away from home when he hasn't

B1

The line should go back to the bottom of the graph

B1

The graph should return to zero

B1

The last part should be decreasing (instead of increasing)

B1

The line for him walking home should have negative gradient

B1

The graph shows he didn't walk home

B1

The line for him walking home should have negative correlation

B0

The line for the journey home goes the wrong way

B0

The graph does not show his journey home

B0

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His house is 2 km away from the shop

B0

The line should be decreasing instead of increasing (which line?)

B0

His home is 1 km from the shop not 2 km

B0

[2]

Q2.
(a)   100

Accept 1 hour 40 (minutes)

B1

Additional Guidance
100 seen with answer 1:40 or 1.40

B1

1:40 or 1.40 without 100 seen

B0

(b)   85

B1

(c)   A

B1

[3]

Q3.
(a)   Line from (08 00, 0) to (09 30, 60)

Line need not be straight
± 1 small square

B1

1 cm horizontal line from their (09 30, 60)
or
horizontal line ending at 10 00

± 1 small square

B1ft

Line from (10 00, 60) to meet the time axis between (11 06, 0) and (11 18, 0) inclusive
or
line from their (10 00, 60) down 6 cm and across 2.4 cm oe

Line need not be straight
± 1 small square

B1ft

(b)   Correct ft decision and reference to their graph
or
correct ft decision and correct ft time (±6 minutes) read from their graph

Must be from a line that meets the time axis at least 6 mins
after their 10 00

B1ft

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Alternative Method

Correct ft decision and calculation of home time

eg 60 miles at 50 mph = 1.2 hours
11 30 is 1.5 hours after 10
or 10 + 1.2 hours = 11 12

ft from their 10 00

B1ft

[4]

Q4.

1 hour 30 (minutes) (× 4) *oe*

M1

6 (hours) *oe*

A1

No and 5

Strand (iii)
Correct decision for their times, M1 awarded

Q1ft

Alternative method 1

5 (hours) (÷ 4) *oe*

M1

1 hour 15 (minutes) or 75 (minutes) or 1.25 (hours) or $1\frac{1}{4}$ (hours) *oe*

A1

No and 1 hour 30 (minutes) or 90 (minutes) or 1.5 (hours) or $1\frac{1}{2}$ (hours)

Strand (iii)
Correct decision for their times, M1 awarded Must compare like for like eg 75 minutes with 90 minutes for 3 marks

Q1ft

Alternative method 2

20 (squares) (÷ 4)

6 (squares) (× 4)

M1

5 (squares)

24 (squares)

A1

No and 6

No and 20   Strand (iii)
Correct decision for their values, M1 awarded.

Q1ft

Alternative method 3

$$\frac{1.5}{5} \text{ (hours) or } \frac{90}{300} \text{ (mins) or } \frac{6}{20} \text{ (sq) } oe$$

M1

$$\frac{6}{20} \text{ or } \frac{90}{300}$$

Or fraction with a denominator that is a multiple of 20

A1

No and $\frac{5}{20}$ or both fractions with same denominator

Strand (iii)
oe Correct decision for their fractions, M1 awarded

Q1ft

Alternative method 4

$$\frac{1.5}{5} \text{ (hours) or } \frac{90}{300} \text{ (mins) or } \frac{6}{20} \text{ (sq)}$$

M1

30% or 0.3

A1

No and 25% or

Strand (iii)
oe Correct decision for their percentages, M1 awarded.
Must compare like with like.

No and 0.25

Q1ft

[3]

Q5.

14 and 22 chosen
or
their 22 – their 14 with either correct

M1

8

A1

[2]

Q6.

(a)　　Plan A

B1

　　　　Valid reason

eg cheaper (for 800 minutes)

B1

(b)   Attempt at any two readings from Plan B slope

eg (600, 30), (700, 60), (800, 90), (900, 120), (1000, 150)
need not be coordinates eg 600(min), (£)30
or (£)30, 600(min)

M1

Compares cost and time or 6000 (÷) 200 or 60 (÷) 200

oe
eg (£)30 in 100 (minutes) (£)120 in 400 (minutes)

M1 dep

30p or £0.30

A1

[5]

Q7.

(a)   Ben and valid reason

eg shortest time
took 4.5 minutes

B1

(b)   Makes 4 correct statements

Must refer to all 3 boys

Max B3 for only referring to 2 boys
Max B2 for only referring to 1 boy
B1 for each valid statement
Valid statements could include:
Alan started in the lead
(Ben 2nd, Carl 3rd)
After 2.5 minutes / 500 m
Ben slowed down
After 3.5 minutes / 600 m
Ben increased speed
After 4 minutes / 600 m
Carl increased speed
After 3 minutes / 800 metres
Alan stopped (for 0.25 minutes)
After 3.25 minutes
Alan set off again
Alan and Carl both finish in 5 minutes
Ben and Carl both finish at the same speed
Finishing order:
Ben wins, Alan and Carl tie for 2nd

B4

[5]

Q8.

(a)   120 ÷ 8 (× 5) (= 15)
or
120 ÷ 1.6

or
120 × 0.625

> *oe*
> *or Complete build-up method (allow one arithmetic slip), eg*
> *8 → 5, 16 → 10, 24 → 15, ... 120 → 75*
> *Allow part build-up method if clear, eg*
> *Build-up to 40 → 25 then 25 × 3*

M1

75

A1

(b)   48 × 0.22

M1

10.56

> *Accept 10.6 if correct working seen*

A1

Allow these alternatives
48 ÷ 4.5
48 ÷ 4.55

M1

[10.6, 10.7]
[10.5, 10.55]

A1

(c)   15 min or $\frac{1}{4}$ hour or 0.25 hours

> *B1 15 or $\frac{1}{4}$ or 0.25*

B2

[6]

Q9.

(a)   (10, 20.8), (20, 21.6), (30, 22.4) and (40, 23.2) plotted

B1

Straight line through their points

> *ft line of best fit following plotting error*

B1ft

(b)   [19.9, 20.1]

B1

(c)   Alternative method 1

21.2 or 22.8

M1

1.6

> *ft their graph*

A1ft

Alternative method 2

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(20.8 + 21.6) ÷ 2 or 21.2
or
(22.4 + 23.2) ÷ 2 or 22.8

M1

1.6

A1

Alternative method 3

23.2 – 21.6
or
22.4 – 20.8
or
21.6 – 20
or
(22.4 – 21.6) × 2
or
(23.2 – 22.4) × 2

Finds the difference for any two masses 20 kg apart
or
Doubles the difference for any two masses 10 kg apart

M1

1.6

A1

[5]

Q10.

(a)   Joins (0, 0) to (30, 20)

Line does not need to be straight but must start and finish at correct points and not be decreasing
Mark intention

B1

Horizontal line for 15 minutes from their (30, 20)

Mark intention

B1ft

Line with gradient 1 or a curve from their (45, 20)
and stops at 60 minutes
or stops at top edge of grid or higher but not beyond 60 minutes

A curve must not be decreasing and must start and finish at two points that could be joined by a line with gradient 1
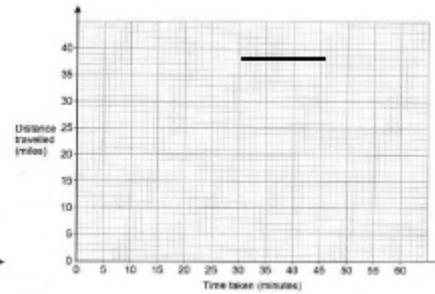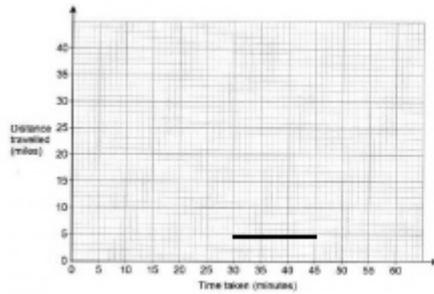*Condone a horizontal or vertical line from 60 minutes*
Mark intention

B1ft

Additional Guidance

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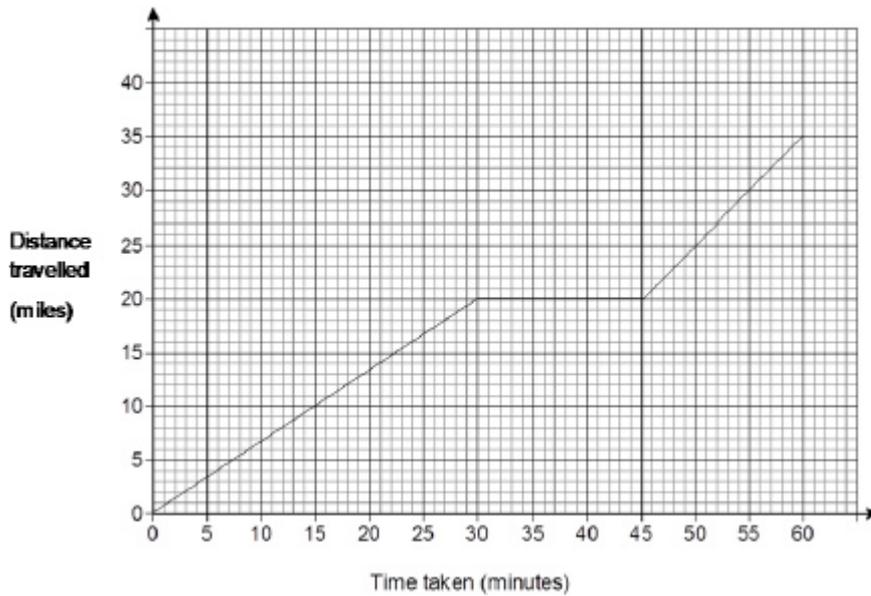
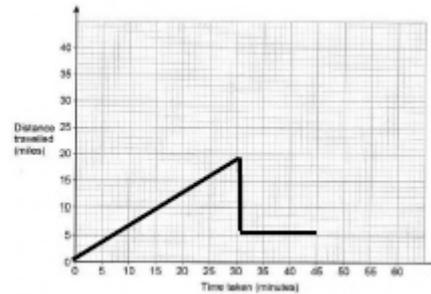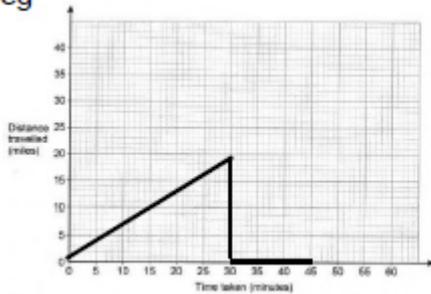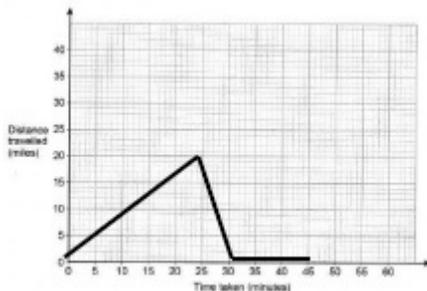Allow any horizontal line between 30 minutes and 45 minutes if first part of journey is blank

eg

Do not allow second mark if their first line is followed by a drop back towards the horizontal axis before she stops
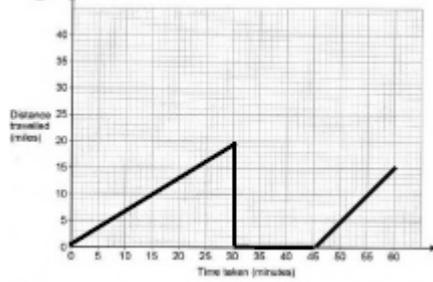
eg

If there are more than 3 lines or curves assume the last part is the part where she

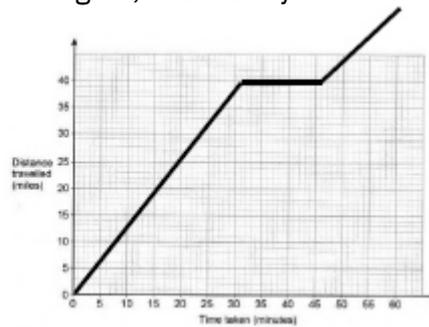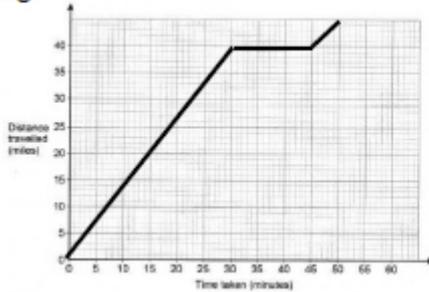AQA GCSE Maths - Real Life Graphs (F)

completes her journey.

B1B0B1ft

If their (45, 20) is too high to fit a line of gradient 1 ending at 60 minutes, allow the final line to stop at the top of the grid or higher, but not beyond 60 minutes

B0B1ftB1ft

Points but no lines

B0

Ignore any lines that could be working for part (a) or part (b)

(b)   35

Correct or ft total distance travelled for their graph at 60 minutes

B1ft

Additional Guidance
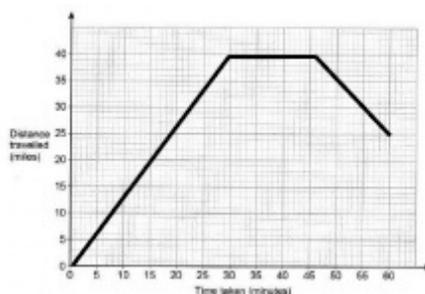
35 from any or no graph

B1

If their graph extends beyond 60 minutes, read off at 60 minutes for ft

Follow through total distance travelled

(a)

(b) answer 25

B0ft

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(b) answer 55

Ignores the stationary parts

Do not follow through a graph above the grid at 60
eg
(a)
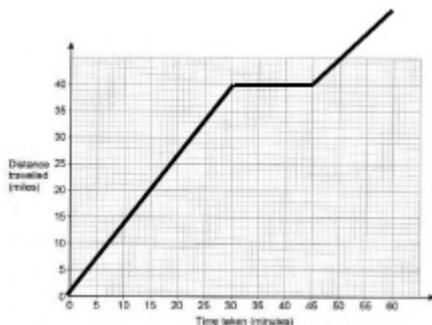
(b) answer 55

Q11.

Graph 1 = *D*

Graph 2 = *A*

Graph 3 = blank

Graph 4 = *B*

Graph 5 = blank

Graph 6 = *C*

B1 for each correct letter in the correct position

Additional Guidance

Choice of answers eg *A* in every position

A in two positions, *D B* and *C* correct

Q12.

(a)   8

(b)   3

Accept −3

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Q13.

   (a)   8 cm

                                                                 B1

   (b) $\dfrac{21-13}{11-6}$

                     oe

                                                                M1

       $\dfrac{8}{5}$ or 1.6

                     oe

                                                                A1

       cm/s or cm s^{-1}

                     oe eg Centimetres per second

                                                                  B1

                                                                                  [4]

Q14.

   (a) $y = \dfrac{1}{x}$

                                                                 B1

   (b)   (0, 1)

                                                                B1

                                                                                   [2]

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