M1.

(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

(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]

M2.

(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]

M3.

(a) 5 (miles)

B1

(b) 4.20

B1

(c) 1.20

ft their (b) − 3

B1ft

[3]

M4.

(a) [80 (mph), 82 (mph)] and France
or
Point on line at 130 km / h identified and France
or
[111 (km / h), 113 (km / h)] and France
or
Point on line at 70 mph identified and France
Condone 110 (km / h)

B1

(b) (60mph) → 96 (km / h)
288 (km) → 180 (miles)

B1

288 (km) ÷ their 96 (km / h) or 3(h)
their 180 (miles) ÷ 60 (mph) or 3 (h)

M1

10.45 (am) + their 3(h) or 1.45 (pm)
or
2 (pm) − their 3(h) or 11(.00 am)
or
2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min
Condone 3.15(h)

M1

Yes and their 1.45 (pm)
or
Yes and their 11(.00 am)
or
Yes and their 3(h) and their 3.25(h)
or
Yes and their 15 minutes
ft B0 M2
Only ft their 96 (km / h) or their 180 miles

A1ft

Alternative method 1
(60mph) → 96 (km / h)

B1

2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min
Condone 3.15(h)

M1

288 (km) ÷ their 3.25(h) or
[88, 89] (km / h)

M1

Yes
and
their [88, 89] (km / h) and their 96 (km / h)

ft B0 M2

Only ft their 96 (km / h) or 180 (miles)

A1ft

Alternative method 2
2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

288 (km) ÷ their 3.25(h) or
[88, 89] (km / h)

M1

[88, 89] (km / h) → [54, 56] (mph)

ft their [88, 89] (km / h)

B1ft

Yes and [54, 56] (mph)

A1

Alternative method 3
2 (pm) − 10.45 or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

60 (mph) × their 3.25(h) or
195 (miles)

M1

195 (miles) → 312 (km)

ft their 195 (miles)

B1ft

Yes and 312 (km)

A1

Alternative method 4
(60mph) → 96 (km / h)

B1

2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

their 96 (km / h) × their 3.25(h)
or 312 (km)

M1

Yes and their 312 (km)

ft B0 M2

Only ft their 96 (km / h)

A1ft

Alternative method 5
288 (km) → 180 (miles)

B1

2 (pm) − 10.45 (am) or 3.25 (h)
or 3 (h) 15 (min)

Condone 3.15 (h)

M1

their 180 (miles) ÷ their 3.25
or [55, 56] (mph)
or
60 (mph) × 3.25 (hours)
or 195 (miles)

M1

Yes and their [55, 56] (mph)
or
Yes and their 180 (miles) and 195 (miles)

ft B0M2

Only ft their 180 (miles)

A1ft

[5]

M5.

(60mph) → 96 (km / h)

288 (km) → 180 (miles)

B1

288 (km) ÷ their 96 (km / h) or 3(h)

their 180 (miles) ÷ 60 (mph) or 3 (h)

M1

10.45 (am) + their 3(h) or 1.45 (pm)
or

2 (pm) − their 3(h) or 11(.00 am)
or
2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

Yes and their 1.45 (pm)
or
Yes and their 11(.00 am)
or
Yes and their 3(h) and their 3.25(h)
or
Yes and their 15 minutes

ft B0 M2

Only ft their 96 (km / h) or their 180 miles

A1ft

Alternative method 1
(60mph) → 96 (km / h)

B1

2 (pm) ÷ 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

288 (km) ÷ their 3.25(h) or
[88, 89] (km / h)
Yes and their [88, 89] (km / h) and
their 96 (km / h)

ft B0 M2

Only ft their 96 (km / h)

A1ft

Alternative method 2
2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

288 (km) ÷ their 3.25(h) or
[88, 89] (km / h)

M1

[88, 89] (km / h) → [54, 56] (mph)

ft their [88, 89] (km / h)

B1ft

Yes and [54, 56] (mph)

A1

Alternative method 3

2 (pm) − 10.45 or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

60 (miles) × their 3.25(h) or
195 (miles)

M1

195 (miles) → 312 (km)

ft their 195 (miles)

B1ft

Yes and 312 (km)

A1

Alternative method 4

(60mph) → 96 (km / h)

B1

10.45 (am) + their 3(h) or 1.45 (pm)
or
2 (pm) − their 3 (h) or 11(.00)(am)
or
2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

their 96 (km / h) × their 3.25(h)
or 312 (km)

M1

Yes and their 312 (km)

ft B0 M2

Only ft their 96 (km / h)

A1ft

Alternative method 5

288 (km) → 180 (miles)

B1

2 (pm) − 10.45 (am) or 3.25(h)
or 3h 15min

Condone 3.15(h)

M1

their 180 (miles) ÷ their 3.25
or [55, 56]
or
60 (miles) × their 3.25(h) or
195 (miles)

M1

Yes and their [55, 56]
or
Yes and their 180 (miles) and
195 (miles)

ft B0 M2

Only ft their 180 (miles)

A1ft

[4]

M6.(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

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]

M7.

(a) −6

B1

(b) 8 seen or marks on the diagram
or 10 + 6 or 24 − 8

M1

16

A1

(c) 16 −6
or 16 + 6

M1

22
SC1 for 10 if -6 and 16 seen

A1

[5]

M8.

(a) Fully correct line drawn.

B1 plots (20, 32) ***or*** *(40, 64) (±* $\frac{1}{2}$ *square)*

B2

(b) 56

ft their graph or correct

B1ft

(c) 15

ft their graph or correct

B1ft

[4]

M9. 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

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

M1

$\frac{6}{20}$ 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

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

M10.

(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]

M11.

(a) 350

B1

(b) 10

ft their 350 ÷ 35 oe

B1ft

(c) Horizontal axis labelled 40, 45, (50)

45 must be in correct place

B1

Vertical axis labelled 400, 450, 500, 550, (600)

550 must be in correct place

B1

Straight line from (35, 350) to (45, 550)

B1 40h → £ 450 shown in working or on grid

or

45 h → £ 550 shown in working or on grid

or

(£)200

Ignore graph beyond 45 hours

B2

[6]

M12. Line (0900,0) to (1100,80)

need not be straiight, but gradient must be positive for all points on the line

B1

Horizontal line 4 $\frac{1}{2}$ squares long for stage 2

ft from the end of the preceding part of the journey and each stage must be in correct order

and

The sections for stages 3 and 5 need not be straight, but gradient must be negative for all points on the line

Horizontal line 1 square across for stage 4

B1ft

Line $\frac{1}{2}$ square across and 3 squares down for stage 3

B1ft

line 1 $\frac{1}{2}$ squares across and down to time axis to represent arriving home for stage 5

B1ft

[4]