M1.

Alternative method 1

24.5 ÷ 7 or 3.5(0) **M1**

63 – 24.5 or 38.5 **M1**

their 38.5 ÷ their 3.5 **M1**

11 **A1**

Alternative method 2

24.5 ÷ 7 or 3.5(0) **M1**

63 ÷ their 3.5 or 18 **M1**

their 18 – 7 **M1**

11 **A1**

Alternative method 3

63 ÷ 24.5 or $\frac{18}{7}$

oe **M1**

7 × their $\frac{18}{7}$ or 18 **M1**

their 18 – 7 **M1**

11 **A1**

[4]

M2.

Alternative method 1

5 × 24.2 or 121 (miles) **M1**

their 121 ÷ 32.3
or
[3.74, 3.75] (gallons) **M1**

their [3.74, 3.75] × 4.5
or
[16.8, 16.9] (litres) **M1**

their [16.8, 16.9] × 1.27 **M1**

[21.33, 21.47] and bus

Accept 21 and bus if working shown

A1

Alternative method 2

5 × 24.2 or 121 (miles)

M1

their 121 ÷ 32.3
or
[3.74, 3.75] (gallons)

M1

1.27 × 4.5
or 5.71(5) or 5.72

M1

their [3.74, 3.75] × their 5.71(5)

M1

[21.33, 21.47] and bus

Accept 21 and bus if working shown

A1

Alternative method 3

19.50 ÷ 5 or 3.9(0)

M1

24.2 ÷ 32.3
or
[0.74, 0.75] (gallons)

M1

their [0.74, 0.75] × 4.5
or
[3.3, 3.4] (litres)

M1

their [3.3, 3.4] × 1.27

M1

[4.19, 4.32] and 3.9(0) and bus

Accept 4 and 3.9(0) and bus if working shown

A1

Alternative method 4

19.50 ÷ 5 or 3.9(0)

M1

24.2 ÷ 32.3
or
[0.74, 0.75] (gallons)

M1

1.27 × 4.5
or 5.71(5) or 5.72

£ per gallon

M1

their [0.74, 0.75] × their 5.71(5)

M1

[4.19, 4.32] and 3.9(0) and bus

Accept 4 and 3.9(0) and bus if working shown

A1

[5]

M3.

10 000 ÷ 400 = 25
or
400 × 25 = 10 000
or
10 000 ÷ 25 = 400

B1

Ticks 'No, the time will be longer' and gives correct explanation

oe

eg He won't be able to run 10 km at same speed/rate/pace as he runs 400 m

B1

[2]

M4.

(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]

M5.

Alternative method 1

90 ÷ 40 or 2.25
or 356 ÷ 40 or 8.9

oe

M1

801

A1

Alternative method 2

40 + 40 + 10
and 356 ÷ 4 or 89

Clear build up method

M1

801

A1

[2]

M6.

Alternative method 1 Price of 40 batteries using packs
40 ÷ 4 or 10 (packs used in offer A)
and
40 ÷ 5 or 8 (packs used in offer B)

oe

8 is implied by the use of 6 packs in offer B

M1

their 10 × 2.52 or 25.2(0)

or their 2.52 ÷ 3 × 2 or 1.68

or their 8 × 2.75 or 22

or $\frac{3}{4} \times 40 \div 5$ or $30 \div 5$ or 6

oe

M1

their 25.2(0) ÷ 3 × 2

or 10 × their 1.68 or 16.8(0)

or $\frac{3}{4} \times$ their 22

or their 6 × 2.75 or 16.5(0)

oe

M1

16.8(0) and 16.5(0)

oe

A1

(Offer) B

Strand (iii)

ft for correct decision based on their values, with one correct value and first two method marks

Q1ft

Additional Guidance
Allow any correct working in pence up to M3

Allow consistent working in pence for M3 and A1Q1ft
16.8(0) or 16.5(0) or 6 × 2.75 is minimum M0M1M1

Alternative method 2 Price of 40 batteries using unit price
2.52 ÷ 4 or 0.63
and
2.75 ÷ 5 or 0.55
oe
M1

40 × their 0.63 or 25.2(0)

or 40 × their 0.55 or 22
oe
M1

their 25.2 ÷ 3 × 2 or 16.8(0)

or $\frac{3}{4} \times 40 \times$ their 0.55

or 30 × their 0.55

or $\frac{3}{4} \times$ their 22 or 16.5(0)
oe
M1

16.8(0) and 16.5(0)
oe
A1

(Offer) B
Strand (iii)
ft for correct decision based on their values, with one correct value and first two method marks
Q1ft

Additional Guidance
Allow any correct working in pence up to M3
Allow consistent working in pence for M3 and A1Q1ft
16.8(0) or 16.5(0) is minimum M0M1M1

Alternative method 3 Price per battery
252 ÷ 4 or 63
and
275 ÷ 5 or 55

oe

M1

their 63 ÷ 3 × 2 or 42

oe

M1

$\frac{3}{4} \times$ their 55 or 41(.25)

oe

M1

42 and 41(.25)

oe

A1

(Offer) B

Strand (iii)

ft for correct decision based on their values, with one correct value and first two method marks

Q1ft

Additional Guidance
Allow any correct working in pounds up to M3
Allow consistent working in pounds for M3 and A1Q1ft
42 or 41(.25) is minimum M0M1M1

[5]

M7.

Alternative method 1

$\frac{1500}{600}$ or 2.5

or $\frac{600}{1500}$ or 0.4

oe

M1

3.3 × 2.5 or 8.25

9.6 ÷ 2.5 or 3.84

$\frac{15}{100} \times 9.6$ *or 1.44*

or 0.85 seen

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

$\frac{15}{100} \times 3.84$

or 0.576

or 0.85 seen

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

M1

9.6 − their 1.44 or 8.16

or 0.0064 × 0.85

3.84 − 0.576

or 0.85 × 3.84

their 8.16 ÷ 2.5

M1dep

8.25 and 8.16

3.26 or 3.264 or 3.27

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 2

3.3 ÷ 600 or 0.0055 (price per 1g)

3.3 ÷ 6 or 0.55 (price per 100g)

M1

9.6 ÷ 1500 or 0.0064

9.6 ÷ 15 or 0.64

$9.6 \times \frac{15}{100}$ *or 1.44*

or 0.85 seen

M1

$\frac{15}{100} \times 0.0064$ or 0.00096

or 0.85 seen

$\frac{15}{100} \times 0.64$ *or 0.096*

or 0.85 seen
9.6 − 1.44
or 0.85 × 1.44
or 8.16

M1dep

their 0.0064 − their 0.00096

or 0.85 × 0.0064

or 0.0054(4)

their 0.64 − their 0.096
or 0.85 × their 0.64
or 0.544
8.16 ÷ 15 or 0.544

M1dep

0.0055 and 0.00544

0.55 and 0.544

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 3
3.3 ÷ 600 or 0.0055 (price per 1 g)

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

9.6 ÷ 2.5 or 3.84
$\frac{15}{100} \times 9.6$ *or 1.44*
or 0.85 seen

M1

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

$\frac{15}{100} \times 3.84$
or 0.85 seen
or 0.576

9.6 − their 1.44
or 0.85 × 9.6
or 8.16

M1

their 8.16 ÷ 1500 or 0.00544

3.84 − 0.576
or 0.85 × 3.84
their 8.16 ÷ 2.5

M1dep

0.0055 and 0.00544

3.26 or 3.27

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 4

600 ÷ 3.3 or 181.8…

3.30 × 5 or 16.50

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

$\frac{15}{100} \times 9.6$ *or 1.44*

or 0.85 seen

M1

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

9.6 − their 1.44
or 0.85 × 9.6
or 8.16

M1

1500 ÷ their 8.16 or 183.8…

their 8.16 × 2 or 16.32

M1

181.8… and 183.8 …

16.32 and 1650

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

[6]

M8.(a) 600

B1

(b) 900 − 860 or 860 + 40 = 900 or 40

or

0.9 − 0.86 or 0.86 + 0.04 = 0.9 or 0.04

Condone 860 − 900

oe

Condone incorrect or missing units

M1

40 grams or 0.04 kg

SC1 940 g or 0.94 kg

A1

Additional Guidance

If you see 860 + 40 = 900 but then further work to build up to eg 1800, mark the whole method and the only mark available is the SC1.
Once 40 g or 0.04 kg seen, ignore any attempt to change units.
40 g seen in working but then 40 on ans line − condone. M1A1

[3]

M9. Any valid conversion seen, eg

10 (cm) = 4 (inches)
25 (cm) = 10 (inches)
30 (cm) = 12 (inches)

Numbers may be marked next to graph

M1

150 (cm) = 60 (inches)

or

75 (inches) = [185, 190] (cm)

or

75 : 150 = 1 : 2 and inch : cm = 1 : 2.5

or

eg 150 ÷ 30 = 5 and 75 ÷ 12 = 6 .(...)

May use any value [60, 75] (inches) correctly converted to cm to show it is not enough

eg 70 inches = 175 cm

A1

Correct conclusion with appropriate values stated

eg No and 60

or No and [185, 190]

or No and each inch needs 2.5 cm and there are only 2

oe

Strand (iii) Allow Q1ft if M1A0 awarded, an arithmetic error made in calculating conversion of 150 cm or 75 inches and a correct conclusion reached for their values. Must be using correct conversions throughout

Q1ft

Alternative method

Divides 150 and 75 by a common factor of at least 5

eg 150 ÷ 10 = 15 and 75 ÷ 10 = 7.5

M1

Reads off accurately for one of their values eg 15 cm = 6 inches

or

Draws lines across and down accurately for both values

A1

Correct conclusion comparing their scaled value and graph value or comparing their pairs of lines

Strand (iii) Allow Q1ft if M1A0 awarded, an error made in reading value and correct conclusion reached for their values

M1

Additional Guidance

Note that the list for Q1 are only examples, there are many other possible valid conclusions

eg1 70 inches = 175 cm so 150 cm is not enough

eg2 150 ÷ 30 = 5 and 75 ÷ 12 = 6 .(...) so No because need 6 times and only 5.

They must be using a correct conversion for all parts of their answer to qualify for the Q mark. Allow arithmetic errors only.

[3]

M10.(a) $y = kx$

$y = kx^2$

B1 for 2 or 3 correct

$y = \frac{k}{x}$

$y = \frac{k}{x^2}$

Ignore incorrect

B2

(b) $8 = \frac{k}{3}$

oe

M1

$8 \times 3 \div 5$

oe

M1

4.8

oe eg $\frac{24}{5}$ *or* $4\frac{4}{5}$

SC1 for $\frac{40}{3}$ *(13.3…)oe*

SC1 for $\frac{40}{9}$ *(4.4…) oe*

SC1 for $\frac{72}{25}$ *(2.88 or 2.9) oe*

A1

[5]

M11.(a) 5.99 ÷ 8 or 599 ÷ 8

Condone 6 ÷ 8 or 600 ÷ 8

M1

74.875 (p) or 74 (p) or 75 (p)

Accept £ 0.74 or £ 0.75 or £ 0.74875

Allow any correct rounding or truncation giving an answer to 2 or more s.f.

A1

(b) 3.99 ÷ 6

or 399 ÷ 6 *oe*

Scaling method used with £ 6

or $\frac{6}{8}$ × 5.99

eg 8 cost £ 6, 4 cost £ 3, 2 cost £ 1.50 6 cost £ 4.50

or 6 × their 75

£3.99 + their £1.50

£5.99 − their £1.50

or 6 × their 0.75

M1

(£) 0.665 or 66(.5) (p) or 67 (p)
6 pack is better value

or 4.4925 or 450p or £4.50
7p, 8p or 9p cheaper per battery

and better value (Yes)
£5.49 or £4.49
Comparison must be with consistent units
ft their (a)

A1ft

Alternative method

8 ÷ 5.99 or 8 ÷ 599
May be seen in (a)

and 6 ÷ 3.99 or 6 ÷ 399
6 costs £2 less (so extras are £1 each)
Compares cost of 24 batteries
£5.99 × 3 and £3.99 × 4

M1

1.3(3) and 1.5(0)
£1 compared with 75p

and 6 batteries better value (Yes)
£17.97 and £15.96
and 6 batteries better value

A1ft

[4]

M12.(a) $\frac{1}{2}$ × (280 + 198) × 86 *oe*

or 198 × 86 + $\frac{1}{2}$ × (280 − 198) × 86

or 280 × 86 − $\frac{1}{2}$ × (280 − 198) × 86

M1

20554

A1

(b) their 20 554 ÷ 4047 or 5.08 or 5.07… or 5.1

4047 ÷ 7 = 578.(14…)

M1

their 5.08 × 7

their 20 554 ÷ their 578.(14…)

M1dep

35.5… or 35.56 or 35.7

A1

35

Rounding down

Q1ft

[6]

M13. 600 and 50 and 200

B2 for any two of 600, 50, 200

B1 for any one of 600, 50, 200

or for sight of $\frac{2}{3}$ *or* $\frac{3}{2}$ *oe,*

or for sight of 2:3 or 3:2 oe

Accept 66%,67%,150%

If no correct values seen,

B1 for any correct proportion

eg Potatoes = 3 × stock

Potatoes = 12 × carrots

Stock = 4 × carrots

B3

[3]

)