

Mark schemes

Q1.

Alternative method 1

$$15 \times 8 \text{ or } 120$$
$$\text{or } 3 \times 6 \text{ or } 18$$

oe total number of hours needed

oe total number of hours worked by the 3 machines

M1

$$15 \times 8 - 3 \times 6 \text{ or } 102$$

oe total number of hours worked by the other 12 machines

M1dep

$$8.5$$

A1

Alternative method 2

$$3 \times (8 - 6) \text{ or } 3 \times 2 \text{ or } 6$$

oe total number of hours not worked by the three machines

M1

$$\text{their } 6 \div 12 \text{ or } 0.5$$

oe that number divided by the other 12 machines

M1dep

$$8.5$$

A1

Alternative method 3

$$15 \times 8 \text{ or } 120$$
$$\text{or } 15 \times 6 \text{ or } 90$$

oe total number of hours needed

oe total number of hours worked in the first 6 hours

M1

$$\frac{15 \times 8 - 15 \times 6}{12}$$

$$\text{or } 2.5$$

oe number of remaining hours divided by the other 12 machines

M1dep

$$8.5$$

A1

Additional Guidance

Note that $15 \div 6$ is not a correct method to get 2.5 (unless simplified from $30 \div 12$), so does not score

[3]

Q2.

17 (days)

*may be implied***B1**their 17×8 or 136

or

their 17×0.08 *oe**eg build up – must be fully correct method**repeated addition can imply their number of days***M1**

1.36

*ft their 17**accept 136p if £ sign deleted***A1ft****Additional Guidance**

16 (days) and £1.28

B0M1A1ft

18 (days) and £1.44

B0M1A1ft

Answer only £1.28

B0M0A0

Answer only £1.44

B0M0A0

Beware digits arising from incorrect work

eg $18 \times 0.8 = 14.4(0)$ **B0M0A0**

Condone £1.36p

B1M1A1**[3]****Q3.****Alternative method 1**15 \times 8 or 120**M1**

500 – their 120 or 380

M1deptheir $380 \div 30$ or 12(...)*oe**Builds up in 30s to at least their 380 – 30 or builds up in 30s from their 120 to at least 470**Allow one error in any build up method*

M1dep

their 12×30 or 360 or their 12 chosen from a build up

oe

Their 12 must either come from rounding down their 12(...) or from choosing their 12 out of a build up or because they had an exact answer of their 12 from a correct method for the third mark

M1dep

their 380 – their 360

or 20 or 500 – (their 360 + their 120)

or their 360 + 8 + 8 (their correct number of 8s)

or 376 or their 360 + their 120 + 8 + 8 (their correct number of 8s) or 496

Their 20 must be $0 < \text{their } 20 < 30$

M1dep

17 pencils, 12 rulers

A1

Alternative method 2

15×0.08 or 1.2(0)

M1

5 – their 1.2(0) or 3.8(0)

M1dep

their 3.8(0) \div (0).3(0) or 12(...)

oe

*Builds up in (0).3(0)s to at least their 3.8(0) – 30 or builds up in (0).3(0)s from their 1.2(0) to at least 4.7(0)
allow one error*

M1dep

their $12 \times 0.3(0)$ or 3.6(0) or their 12 chosen from a build up

Dep on previous mark

Their 12 must either come from rounding down their 12(...) or from choosing their 12 out of a build up or because they had an exact answer of their 12 from a correct method for the third mark

M1dep

their 3.8(0) – their 3.6(0) or (0).2(0)

or 5 – (their 3.6(0) + their 1.2(0))

or their 3.6(0) + (0).08 + (0).08 (their correct number of (0).08s)

or 3.76 or their 3.6(0) + their 1.2(0) + (0).08 + (0).08 (their correct number of (0).08s) or 4.96

their 0.20 must be $0 < \text{their } 0.20 < 0.30$

M1dep

17 pencils, 12 rulers

A1

Additional Guidance

Do not allow mixed units in working unless recovered

For build-up, one arithmetic mistake counts as one error, even though more than one value may be affected

eg, 30, 60, 90, 130, 160, 190, 220, 250, 280, 310, 340, 370 gets 3rd mark in alternative method 1 (error from 90 to 130, but 30 then added correctly throughout)

If there is no change possible, or change is not considered after rulers are bought, it is maximum M4

Example $15 \times 8 = 120$ $500 - 120 = 360$

$360 \div 30 = 12$ then 12 chosen as number of rulers but no further work (4th mark awarded despite no "remainder" but 5th mark has to consider change)

M1M1M1M1M0A0

Example $15 \times 8 = 120$ $500 - 120 = 380$

$380 \div 30 = 9.2$ and 9 chosen as the number of rulers (no further work)

M1M1M1M1A0A0

[6]

Q4.

360

B1 for each correct answer

3

SC1 answers incorrect with sight of 3

900

SC1 answers in correct proportion eg 240, 2, 600

B3

[3]

Q5.

$24 \div 6$ or 4 seen

or 4 tablespoons

M1

$75 \times$ their 4 or $60 \times$ their 4 or $175 \times$ their 4

oe

M1 dep

300 or 240 or 700

A1 ft

300 and 240 and 700 and 4

A1

[4]

Q6.

- (a) $2.4(0) + 4.8(0)$
or 2.4×3
or $12 - 4.8$
or 7.2
or $240 + 480$

or 240×3
or $1200 - 480$
or 720

*Any correct calculation that would give the
cost of 3 boxes*

M1

7.20

A1

- (b) Any combination of costs for more than 10 boxes correctly evaluated
or $52.8(0) \div 2.4(0)$
or $5280 \div 240$
or $528 \div 24$

eg 15 boxes

oe

M1

22

A1

Additional Guidance

The correct cost may come from adding values in the table, multiplying by 2.40 or subtracting values from £52.80

11 boxes £26.40 15 boxes £36.00 19 boxes £45.60

12 boxes £28.80 16 boxes £38.40 20 boxes £48.00

13 boxes £31.20 17 boxes £40.80 21 boxes £50.40

14 boxes £33.60 18 boxes £43.20

Condone missing signs or end 0s

- (c) 4 : 5

Must be in simplest form

B1

Additional Guidance

Any units seen

eg £4 : £5

B0

[5]

Q7.

$450 \div 2$ or 225

$450 \div 4$ or 112.5

450×7 or 3150

450×14 or 6300

450×3 or 1350

450×4 or 1800

oe

M1

their 225×7 , their 112.5×14

their 225×7 , their 112.5×14 their $3150 \div 2$, their $6300 \div 4$

their $3150 \div 2$, their $6300 \div 4$

their $1350 + 450 \div 2$

their $1800 - 450 \div 2$

or equivalent complete method scores M2

M1

1575

A1

[3]

Q8.

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]

Q9.

$\div 2$

B1

[1]

Q10.

$2476 \div (3 + 1)$ or 619

oe

M1

their $619 \times (3 - 1)$ or their 619×2

or

$2476 \div (3 - 1)$ or $2476 \div 2$

or

their $619 \times 3 -$ their 619

or

$$(2476 - \text{their } 619) - \text{their } 619$$

or

$$1857 - 619$$

oe

M1

$$1238$$

A1

Alternative method

$$(3 + 1) \div (3 - 1) \text{ or } 4 \div 2$$

or

$$(3 - 1) \div (3 + 1) \text{ or } 2 \div 4$$

oe

M1

$$2476 \div \text{their } 2$$

$$\text{or } 2476 \times \text{their } \frac{1}{2}$$

oe

M1

$$1238$$

A1

[3]

Q11.

$$-72$$

B1

$$0$$

B1

[2]

Q12.

(a) 2 or two

B1

Additional Guidance

Allow words which imply two times
e.g. double, twice

B1

(b) $\div 4$

B1

[2]

Q13.**Alternative method 1**

5×24.2 or 121 (miles)

M1

their $121 \div 32.3$

or

[3.74, 3.75] (gallons)

M1

their [3.74, 3.75] $\times 4.5$

or

[16.8, 16.9] (litres)

M1

their [16.8, 16.9] $\times 1.27$

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 $121 \div 32.3$

or

[3.74, 3.75] (gallons)

M1

1.27×4.5

or 5.71(5) or 5.72

M1

their [3.74, 3.75] \times their 5.71(5)

M1

[21.33, 21.47] and bus

Accept 21 and bus if working shown

A1

Alternative method 3

$19.50 \div 5$ or 3.9(0)

M1

$24.2 \div 32.3$

or

[0.74, 0.75] (gallons)

M1

their [0.74, 0.75] $\times 4.5$

or

[3.3, 3.4] (litres)

M1

their $[3.3, 3.4] \times 1.27$

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

$19.50 \div 5$ or $3.9(0)$

M1

$24.2 \div 32.3$

or

$[0.74, 0.75]$ (gallons)

M1

1.27×4.5

or $5.71(5)$ or 5.72

£ per gallon

M1

their $[0.74, 0.75] \times$ 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]

Q14.

Alternative method 1

$90 \div 40$ or 2.25

or $356 \div 40$ or 8.9

oe

M1

801

A1

Alternative method 2

$40 + 40 + 10$

and $356 \div 4$ or 89

Clear build up method

M1

801

A1

[2]

Q15.

(a) $1.6 \times 6 \frac{1}{2}$

M1

10.4 oe

A1

(b) Use or sight of 4.5(4) litres = 1 gallon oe

B1

A correct single step calculation

$$50 \times 1.6 \text{ or } 80$$

$$100 \div 1.6$$

$$100 \div 5.5$$

$$\text{or } 5.5 \div 100$$

$$5.5 \div 4.5$$

$$\text{or } 4.5 \div 5.5$$

$$50 \div 4.5$$

$$\text{or } 4.5 \div 50$$

M1

A **different** correct single step calculation

$$50 \times 1.6 \div 4.5$$

$$80 \div 4.5$$

$$4.5 \div (50 \times 1.6)$$

$$4.5 \div 80$$

or

$$(50 \div 4.5) \times 5.5$$

$$100 \div (5.5 \div 4.5)$$

A correct two-step calculation

$$(100 \div 1.6) \div 5.5$$

$$100 \div 5.5 \times 4.5$$

$$(100 \div 1.6) \times 4.5$$

M1dep

Two matching values

(May be rounded)

(May be multiples of figures listed)

Units	Manu facturer	My Car
<i>Km per litre</i>	18.18	17.7*
<i>Km per gallon</i>	81.8*	80
<i>Litres per 100 km</i>	5.5 (given)	5.625*
<i>Litres per km</i>	0.055	0.05625*
<i>Miles per litre</i>	11.36*	11.1

Litres per mile	0.088*	0.09
Miles per 5.5 litres	62.5	61.1*
Km per 5.5 litres	100 (given)	97.8*
Gallons per mile	0.019..*	0.02
Miles per gallon	51.1*	50 (given)
Gallons per km	0.0122..	0.0125*
Litres per 800 km	44	45*

**these values imply a correct two-step calculation for M2
Values may be rounded or truncated such that correct comparisons can still be made.*

A1

More fuel

Q1

[7]

Q16.

Alternative method 1

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

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

oe

M1

$$3.3 \times 2.5 \text{ or } 8.25$$

$$9.6 \div 2.5 \text{ or } 3.84$$

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

or 0.85 seen

M1

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

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 $\div 2.5$

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

$3.3 \div 600$ or 0.0055 (price per 1g)

$3.3 \div 6$ or 0.55 (price per 100g)

M1

$9.6 \div 1500$ or 0.0064

$9.6 \div 15$ 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 $0.85 \times$ their 0.64

or 0.544

$8.16 \div 15$ or 0.544	M1dep
0.0055 and 0.00544 0.55 and 0.544	A1
1500 g pack identified <i>Strand(iii) correct conclusion for their values provided method marks have been awarded</i>	Q1ft
Alternative method 3 $3.3 \div 600$ or 0.0055 (price per 1 g)	M1
$\frac{15}{100} \times 9.6$ or 1.44 or 0.85 seen $9.6 \div 2.5$ 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 $8.16 \div 1500$ or 0.00544 $3.84 - 0.576$ or 0.85×3.84 their $8.16 \div 2.5$	M1dep
0.0055 and 0.00544 3.26 or 3.27	A1
1500 g pack identified <i>Strand(iii) correct conclusion for their values provided method marks have been awarded</i>	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]**Q17.**

12.5(0) + 12.5(0) ÷ 2

or

12.5(0) + 6.25

or

12.5(0) × 1.5 or 18.75

*oe**Cost of 2 suits*

M1

9.75 × 4

or

 $9.75 \times \frac{2}{3} \times 6$ or 6.5(0) × 6

or 39(.00)

oe

eg $9.75 \times 6 - 9.75 \times 2$ or $58.5(0) - 19.5$

Cost of 6 dresses

M1

their 18.75 + their 39(.00)

dep on at least M1 awarded

Must be adding their suit(s) and their dress(es)

May be implied by final answer

M1dep

57.75

Accept £57.75p

A1

Additional Guidance

$6.25 + 9.75 \times 6$

M0M0M0dep

$6.25 + 39$

M0M1M1dep

$12.50 \times 2 + 39$

M0M1M1dep

$18.75 + 9.75 \times 2$

M1M0M1dep

[4]

Q18.

Eliminate 1 pack of 8 and 1 pack of 6

May be implied from later working

B1

Correct scaling for any 2 of the 4 options

eg:

Unit costs

Any 2 of

$$\text{Pack of 6} = \frac{1.95}{6} \text{ or } 32.5(p)$$

$$\text{Pack of 8} = \frac{2.64}{8} \text{ or } 33(p)$$

$$2 \text{ Packs of 6} = \frac{3.50}{12} \text{ or } 29.(...)(p)$$

$$2 \text{ Packs of 8} = \frac{5}{16} \text{ or } 31(.25)(p)$$

Cost of 48 cans

Any 2 of

Pack of 6 = 1.95×8 or (£)15.60 (8 packs)
 Pack of 8 = 2.64×6 or (£)15.84 (6 packs)
 2 Packs of 6 = 3.50×4 or (£)14 (4 × 2-packs)
 2 Packs of 8 = 5×3 or (£)15 (3 × 2-packs)

M1

Equivalent scalings for both 2-packs
 eg 29 and 31 or 14 and 15 etc

M1dep

Chooses 4 × 2-packs of 6 with correct values for both 2-packs seen

A1

Additional Guidance

Correct values may be seen in working

[4]

Q19.

78×5 or 1.99×2 oe

Attempt at a sensible scale for one of the bottles (e.g multiple of 5 for 78p or multiple of 2 for £1.99 or one from list below)

M1

78×5 (390) and 1.99×2 (3.98) oe

or $78 \div 60$ (1.3) and $199 \div 150$ (1.326)

Attempt to compare equal quantities (any units)

or $78 \div 4$ (19.5) and $199 \div 10$ (19.9)

or $60 \div 78$ (0.769) and $150 \div 199$ (0.7537)

Note: May use 600 and 1500 (ml)

or 78×2.5 (195)

or $199 \div 2.5$ (79.6)

M1dep

e.g. (£) 3.90 and (£) 3.98 oe

*Correct values for their comparison
 Money units can be in p or £
 Capacity units must be consistent*

A1

Small

*Strand (iii)
 Correct conclusion from correct values
 Must compare equal quantities*

Q1

[4]

Q20.

y is directly proportional to $\frac{1}{x}$

B1
[1]

Q21.

D

B1
[1]

Q22.

$$y = kx$$

B1
[1]

Q23.

$\div 4$

B1
[1]

Q24.

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

B1
[1]