Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1	a		400 × 8 [=3200]	1	Condone **also** doing the reverse 3200 ÷ 8 or 3200 ÷ 400 as a check
	b		$\frac{1}{3}$	3	**B2** for $\frac{1600}{4800}$ oe — May be $\frac{4800}{1600}$ oe — Answers of 33.3[3…]% or 0.333[3…] or 3 score **B2** or **M2** for $1 - \frac{3200}{4800}$ oe — May be $1 - \frac{1}{1.5}$ or $1 - \frac{x}{1.5x}$ or $\frac{4800-3200}{4800}$ etc or e.g. $\frac{2}{3}$ or $\frac{3}{2}$ 66% to 67% or 0.66 to 0.67 or $\frac{400}{600}$ or 1.5 **B1** for $\frac{3200}{4800}$ oe or $\frac{4800}{3200}$ oe of 1600 — A time may be chosen e.g. 1 hour 4800 in 60 min, 80 per min 3200 in 60 min, $\frac{160}{3}$ per min **B1** for $\frac{60}{\frac{160}{3}}$ **M2** for $1 - \frac{60}{\frac{160}{3}}$ etc
		Total		**4**	
2	a		1.35 × 3 + 2 × 1.35	1	Addition implied by column with answer at bottom Accept 1.35 × 5 or 1.35 + 1.35 + 1.35 + 1.35 + 1.35

						Condone 6 × 1.35 – 1.35 If working in pence must change 675 to 6.75
b		B 15[p] with 25.65 and 25.5[0] seen		5	**B2** for [total price A] 25.65 or **M2** for 6 × 3 × 1.35 + 1.35 **oe** or **M1** for 25 ÷ 4 or 6 [lots] or $\frac{1.35 \times 3}{4}$ **soi** 1.0125 **AND** **B2** for [total price B] 25.5[0] or **M2** for 8 × 2 × 1.5[0] + 1.5[0] **oe** or **M1** for 25 ÷ 3 or 8 [lots] or $\frac{[3.00]}{3}$ **soi** 1 If **0**, **1 or 2** scored, instead award **SC3** for Shop B and 15[p] or If **0 or 1** scored, instead award **SC2** for *their* cheapest shop and correct difference between *their* prices in pence	$3 \times 1.35 = (4.05)$ then *their* $4.05 \times 6 = (24.3) + 1.35$ or $\frac{1.35 \times 3}{4} \times 24 + 1.35$ **oe** or 19 × 1.35 **oe** May be 4 + 4 + 4 + 4 + 4 + 4 or 1.5[0] ÷ 2 = 3[.0] then *their* 3 × 8 = (24) + 1.5[0] or $\frac{3.0}{3} \times 24 + 1.50$ or 17 × 1.5 **oe** *Their* two total prices must be clearly identifiable Allow £ sign added to give e.g. £2.05[p]

			Total		6	
3			12 000 with correct working		6	

Correct working requires evidence of at least 3 M marks

Accept any letter for *x*
e.g. **M3** for
$x \times [0].015 \times 6 = x \times [0].011 \times 7 + 156$
or $[0].09x = [0].077x + 156$

M3 for
$\frac{x \times 1.5 \times 6}{100} - \frac{x \times 1.1 \times 7}{100} = 156$
better

or

M1 for $\frac{x \times 1.5 \times 6}{100}$ **oe**

e.g.$[0].015x \times 6$ or $\frac{0.9x}{100}$ or $0.09x$

M1 for $\frac{x \times 1.1 \times 7}{100}$ **oe**

e.g.$[0].011x \times 7$ or $\frac{7.7x}{100}$ or $0.077x$

AND

M1FT for correctly removing fractions

<u>If both equations seen but only one used allow **M1, M1** to stand</u>
FT *their* equation in one variable

M1FT for correct single *x* term **isw**

e.g. $[0].013x$ [= 156]
Note: $[0].09x – [0].077x = 156$ scores **M4**

If 0, 1 or 2 scored, instead award SC3 for answer 12 000 with no or insufficient working

Any calculation of 1.5% or 1.1% of 156 scores **0**

					For additional information refer to '2024 November, J560/03, Alternative, Mark Scheme Appendix' within downloadable extra resource materials.
		Total	**6**		
4		27	3	**M1** for [1 share =] $\frac{100-1}{4+7}$ **oe** and **M1** for *their* 9 × (3 or 7 and 4) **oe** or **M1** for one from <table><tr><td>[Darcie]</td><td>[Ivan]</td></tr><tr><td>20</td><td>35</td></tr><tr><td>24</td><td>42</td></tr><tr><td>28</td><td>49</td></tr><tr><td>32</td><td>56</td></tr></table>	**M1** may be implied by 9 [Darcie] 36 and [Ivan] 63 implies **M1M1** *Their* 9 from $\frac{100-1}{4+7}$ or $\frac{100+1}{4+7}$ or $\frac{100}{4+7}$ may be decimal
		Total	**3**		
5		651.4	3	**M1** for 16 × 10.4 **oe soi** by 166.4 **M1** for 350 + 80 + 55 + *their* 166.4 **oe**	e.g. 160 × 1.04 May be ratio method with × 16 **oe** seen *Their* 166.4 from attempt at first **M1** and ≠ 160 Addition may be a series of sums or implied by a vertical list with

						number below Accept 485 + *their* 166.4
			Total	**3**		
6			27664	4	**B3** for 97336 or 10000, 9200 and 8464. or **M2** for 125 000 × 0.92³ or 125000 × 0.08 and *their* 115000 × 0.08 and *their* 105800 × 0.08 or **M1** for 1 − 0.08 implied by 0.92 or 125000 × 0.08 *and their* 115000 × 0.08 may be implied 10000 and 9200 or by 115000 and 105800	
			Total	**4**		
7			945	3	**M2** for 180 × 1.5 × 3.5 **oe** or **M1** for [flour=] 180 × 1.5 may be implied by 270 or [flour=] 180 ÷ 10 × 1.5 may be implied by 27 or [butter=] 180 ÷ 10 × 35 may be implied by 630 or 35 ÷ 10 **soi** 3.5	e.g. $\frac{180}{10} \times 1.5 \times 35$ 270 g flour [in 10 cookies] 27 g flour [in 1 cookie] 630 g butter [in 35 cookies]
			Total	**3**		

8		No, and *their* final result [£]115.2[0] with correct working oe or No and 79.8 or 79.9 or 79.86 to 79.87 with correct working	4	**M1** for 38.88 ÷ 27 may be implied by 1.44 or 80 ÷ 27 may be implied by 2.96[2]… **M1** for 115 ÷ *their* 1.44 or 80 × *their* 1.44 or 38.88 × *their* 2.96[2]… **A1** for 79.9 or 79.8 or 79.86 to 79.87 or 115.2[0]	*Their* 1.44 must come from a division of 38.88 Allow explanations with rounding of 79.86 to 79.87
		Total	**4**		
9		2 : 5	2	**B1** for any correct ratio not in simplest form	Accept 1 : 2.5, 0.4 : 1 6 : 15 etc may be in working
		Total	**2**		
10		2160 with correct working	5	**Method 1** **M3** for $\dfrac{360}{4 \times 0.05}$ **oe may** be implied by 1800 or **M2** for $\dfrac{360}{0.05}$ **oe or** $\dfrac{360}{4} \div 5$ or $\dfrac{360}{5} \div 4$ or **M1** for $\dfrac{360}{4}$ or $\dfrac{360}{5}$ or $\dfrac{P \times 5 \times 4}{100} = 360$ **oe** AND **M1dep** for *their* 1800 + 360	Correct working for **5** marks requires evidence of at least **M2** N/C methods need labels or operators **oe 360** = 1800 × 4 × (0.05 or 5 / 100) or $\dfrac{360}{20} \times 100$ or N/C e.g. 5% = 90, 1% = 18, 100% = 1800 or 20% = 360, 10% = 180, 100% = 1800 or 20% = 360, 360 × 5 = 1800 or or 1 year = 90, 1% = 18, 100% = 1800

						NB 360 × 5 = 1800 **alone** scores **M0** May be implied by 9000 or 18 or N/C e.g. 5% = 90, 1% = 18 or 20% = 360, 10% = 180 May be implied by 90 or 72 or N/C e.g. 5% = 90 or 20% = 360 "May be implied" tells you to look for the correct working associated with these values *Their* 1800 dependent on **M3** and not spoiled
				OR **Method 2 Trials** **M2** for two complete trials bracketing 360 and resulting in 360 ±10 or **M1** for one complete trial ≠ 360 If **0** or **1** scored, instead award **SC2** for 2160		Trials must show substitution and evaluation e.g. 1850 × 0.05 × 4 **oe** = 370 1750 × 0.05 × 4 **oe** = 350 e.g. 500 × 0.05 × 4 **oe** = 100 with no working or insufficient working
			Total	**5**		
11	a		[0]8 26 **oe**	2	**B1** for 16 [minutes]	Accept any recognisable time format e.g. full stop, colon, gap and inclusion of am but not pm
	b		24	3		

					FT *their* time added to 8.10 leading to answer in (a) or stated as cycling time in (a) **B1** for 8 [minutes cycling] or *their* cycle time in (a) ÷ 2 **M1** for *their* cycle time in (a) ÷ 2 + 16	No FT if working not shown in (a) but **if 9.14 is answer in (a)** working does not need to be seen to **FT** **Example** *Their* time in (a) is 64 then [cycling =] (64 ÷ 2 =) 32 for **B1** [walking =] (32 ÷ 2 =) 16 **M1** for 32 + 16 **3 marks** for answer 48 (check (a) = 9.14 or cycle time = 64) Here 32 ÷ 2 = 16 minutes to walk half the distance Must be correctly evaluated
			Total	**5**		

12			28 [kg]
			16 [kg]
				2	**B1** for each
					
					or
					M1 for 52 ÷ 6.5 may be implied by 8
					    or 44 ÷ 5.5
					    or 44 ÷ 2
						Accept working in g but final answer must be correct
						
						8 used in multiplication or division
						e.g. 8 ÷ 2 then added to 8
						Method may be seen with multipliers as e.g.

$$\times 3.5 \searrow \fbox{$\frac{1}{3.5}$} \times 2$$
$$\frac{}{2}$$

$$\times 3.5 \searrow \fbox{$\frac{8}{A}$} \times 2$$
$$\frac{}{B}$$

		Total		**2**		
13		240		2	**M1** for 189.6 ÷ 0.79 **oe** implied by figs 24[0]	**M1** may be implied by a list, 0.79, 1.58, 2.37,… but must reach 189.6 or beyond
		Total		**2**		
14	a	C		1		If nothing on answer line look for clear indication in list Allow $\frac{3}{4} \times 18$ on answer line
	b	4.5[0]		2	**M1** for $\frac{1}{4} \times 18$ **oe**	e.g. 0.25 × 18 or 18 ÷ 2 ÷ 2 or 4 × 4.5 = 18 etc but not $\frac{1}{4}$ **of** 18 **M1** for $18 - \frac{3}{4} \times 18$ May be seen as 18 − 13.5
		Total		**3**		
15		20 000 × 1.02 **oe** or 20 000 × 0.02 **oe** 20 400 or 400 or 1.0404 20 400 × 1.02 **oe** or 20 400 × 0.02 **oe** or 400 × 1.02 **oe** or 400 × 0.02 **oe** 400 and 408 or 20 808		M1 B1 M1FT A1	**M1FT** for *their* 20 400 × 1.02 **oe** or *their* 20 400 × 0.02 **oe** or *their* 400 × 1.02 **oe** or *their* 400 × 0.02 **oe**	e.g. 1% = 200, 2% = 400 We do not allow mis-reads in this question **M1M1** implied by 20 000 × 1.02^2 **oe** **M1FT** implied by

					A1 dep M1B1M1	20 808 or 408 or 8 For method we do not accept e.g. 102% × 20 000 or 2% of 20 000
			Total	**4**		
16			$\frac{21}{40}$ **oe** with correct working	5	**M1** for 40 – 9 – 1 **M1** for *their* 30 ÷ (3 + 2) **A1** for 12 or 18 AND **B1** for answer $\frac{21}{k}$. or answer $\frac{p}{40}$. If **0** or **1** scored, instead award **SC2** for answer of $\frac{21}{40}$ **oe**	<u>Correct working requires evidence of at least **M1M1A1** **isw**</u> conversion/cancelling after correct answer seen Do not accept ratio or words All method marks may be seen on diagram **M1** implied by 30 **M1** implied by 6 Repeated addition/subtraction see appendix 18:12 or 12:18 implies **M1M1A1** Where *k*>21 and an integer Where *p*<40 and a positive integer For algebraic method, refer to 'Qn26, 2024 June, Alternative J560/02, Mark Scheme Appendix' within downloadable resource materials.
			Total	**5**		

17	$\frac{5}{9}$ 24	1 2	**B1** for 6 or 54 or **M1** for 4 : 5 = n : 30 **oe** or for 30 ÷ 5 If **0** or **1** scored instead award **SC2** for correct values in incorrect place	May be embedded within a longer valid calculation e.g. 30 ÷ 5 × 4 or 30 ÷ 5 × 9 [– 30]
	Total	**3**		
18	4 : 3	1		If colon not used do not accept 1.3 or 1.33... Accept 1.3:1 or 1 : 0.75
	Total	**1**		
19	440	4	**M3** for $\frac{8\times60\times11}{12}$ **oe** OR **M2** for $\frac{8\times60}{12}$ **oe** may be implied by 40 or for $\frac{60\times11}{12}$ **oe** may be implied by 55 OR **M1** for $\frac{11}{12}$ may be implied by $0.91\dot{6}$ or for $\frac{12}{11}$ may be implied by $1.0\dot{9}$ or for 8 × 60 may be implied by 480 or for $\frac{60}{12}$ may be implied by 5	e.g. **M3** for 480 × $0.91\dot{6}$ or 480 ÷ $1.0\dot{9}$ or 8 × 55 e.g. **M2** for 8 × 5 or 60 × $0.91\dot{6}$ **M3** and **M2** may be seen in stages
	Total	**4**		
20	75 with correct working	5		

					M1 for $\frac{9}{10} \times 600$ **oe** may be implied by 540 or 90% AND **B2** for 450 or **M2** for $\frac{their\,540}{6} \times 5$ **oe** or $\frac{90}{6} \times 5$ OR **B1** for 90 or 15% or **M1** for $\frac{their\,540}{6}$ or $\frac{90}{6}$ AND **M1** for $\frac{their\,450}{600}\,[\times\,100]$**oe** If **0** or **1** scored, instead award **SC2** for answer 75 with no or insufficient working	"Correct working" requires evidence of at least **M1** AND **M1** 100% = 600, 1/10 = 10% = 60 600 – 60 = 540 Award **B2** for 90 : 450 or 450 : 90 *their* 540 must come from use of 600 *their* 450 must come from an attempt at a correct method
			Total	**5**		
21	a		300 × 8 [=2400]	1		Condone **also** doing the reverse 2400 ÷ 8 or 2400 ÷ 300 as a check **Examiner's Comments** Many correct calculations of 300 × 8 were seen. Several candidates worked backwards from 2400 and so did not score the mark.
	b		$\frac{1}{3}$	3	**B2** for $\frac{1200}{3600}$ **oe**	May be

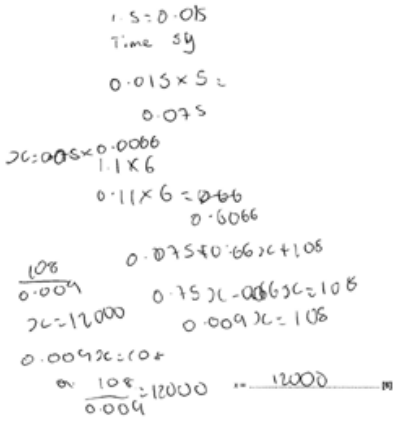|					or	$\frac{3600}{1200}$ oe

or

M2 for $1 - \frac{2400}{3600}$ oe

or

B1 for

$\frac{2400}{3600}$ oe or $\frac{3600}{2400}$ oe

or 1200

$\frac{3600}{1200}$ oe

Answers of 33.3[3...]% or 0.333[3...] or 3 score B2

May be

$1 - \frac{1}{1.5}$ or $1 - \frac{x}{1.5x}$

or

$\frac{3600 - 2400}{3600}$ etc

e.g. $\frac{2}{3}$ or $\frac{3}{2}$ 66% to 67% or 0.66 to 0.67 or $\frac{300}{450}$ or 1.5

A time may be chosen
e.g. 1 hour
3600 in 60 min, 60 per min
2400 in 60 min, 40 per min
B1 for $\frac{40}{60}$, M2 for $1 - \frac{40}{60}$ etc

Examiner's Comments

This question was a challenge for many candidates.

More successful candidates took the efficient route that 3600 would be made in the time that 2400 were made. Therefore $\frac{2}{3}$ of the time would be needed and saving $\frac{1}{3}$ of the time.

Many candidates worked with 300 or 6000; fractions formed from combinations of these were seen, butoften not leading to an answer. Quite a few candidates gained a mark for 12 000 or $\frac{2}{3}$, but the method often stopped at this point.

			Total	**4**	
22	a		1.25 × 3 + 2 × 1.25 oe	1	

						Addition implied by column with answer at bottom Accept 1.25 × 5 or 1.25 +1.25 +1.25 +1.25 +1.25 Condone 6 × 1.25 – 1.25 If working in pence must change 625 to 6.25

Examiner's Comments

Candidates answered this question well and several methods were used successfully.

The few candidates who didn't gain the mark missed showing a critical step, e.g. missing out 1.25 × 2 and just assuming it was clear that two cupcakes cost £2.50.

Exemplar 1

It is important when answering 'Show that...' questions that all necessary steps are shown.

	b		A 5[p] with 23.75 and 23.8[0] seen		5	**B2** for [total price A] 23.75 or **M2** for 6 × 3 × 1.25 + 1.25 oe or **M1** for 25 ÷ 4 or 6 [lots] or $\frac{1.25 \times 3}{4}$ soi 0.9375 AND	3 × 1.25 = (3.75) then *their* 3.75 × 6 = (22.5) + 1.25 or $\frac{1.25 \times 3}{4} \times 24 + 1.25$ oe or 19 × 1.25 oe May be 4+4+4+4+4+4 or 1.4[0] × 2 = 2.8[0] then

B2 for [total price B] 23.8[0]
or
M2 for 8 × 2 × 1.4[0] + 1.4[0] oe

or

M1 for 25 ÷ 3
or 8 [lots]

or $\frac{2.80}{3}$ soi 0.93

If **0, 1 or 2** scored, instead award **SC3** for Shop A and 5[p]
or
If **0 or 1** scored, instead award **SC2** for *their* cheapest shop and correct difference between *their* prices in pence

their 2.80 × 8 = (22.4) + 1.4[0]

or $\frac{2.80}{3} \times 24 + 1.40$

or 17 × 1.4 oe

May be 3+3+3+3+3+3+3+3

Their two total prices must be clearly identifiable
Allow £ sign added to give e.g. £2.05[p]

Examiner's Comments

This was answered well by the majority of candidates who tackled it.

Not many candidates got the solution completely correct, but many picked up B2 for one correct total price or M1 for identifying the numbers of special offer batches needed from each shop.

A common error was to ignore the special offers and work out the cost of 25 cupcakes at £1.25 and £1.40. Some candidates did attempt to compensate for the special offers after this start, but the method rarely produced the correct result.

Many lists of costs were seen rather than more efficient calculator methods.

Candidates who gave two incorrect prices sometimes lost the SC mark because they did not convert their difference in pounds to pence or did not give their answer with a '£'

						sign (for example, calculating a difference of £3.30 and then responding 'Shop B by 3.30p').
			Total	**6**		
23			12 000 with correct working	6	**M3** for $\frac{x \times 1.5 \times 5}{100} - \frac{x \times 1.1 \times 6}{100} = 108$ oe or better or **M1** for $\frac{x \times 1.5 \times 5}{100}$ oe **M1** for $\frac{x \times 1.1 \times 6}{100}$ oe AND **M1FT** for correctly removing fractions **M1FT** for correct single x term *isw* If **0, 1** or **2** scored, instead award **SC3** for answer 12 000 with no or insufficient working **Examiner's Comments**	Correct working requires evidence of at least 3 M marks Accept any letter for x e.g. M3 for $x \times [0].015 \times 5 = x \times [0].011 \times 6 + 108$ or $[0].075x = [0].066x + 108$ e.g. $[0].015x \times 5$ or $\frac{7.5x}{100}$ or $0.075x$ e.g. $[0].011x \times 6$ or $\frac{6.6x}{100}$ or $0.066x$ If both equations seen but only one used allow M1, M1 to stand FT *their* equation in one variable e.g. $[0].009x [= 108]$ Note: $[0].075x–[0].066x=108$ scores M4 Any calculation of 1.5% or 1.1% of 108 scores 0 For additional information refer to '2024 November, J560/03, Mark Scheme Appendix: item 3' within downloadable extra resource materials.

This question was attempted by many candidates, but fewer than hoped as there was a question in a similar context in summer 2024.

Of those who did attempt the question, few scored above 2 marks.

A very small number of candidates attempted the main method of creating expressions and then an equation using x and 108.

A common start (which probably led into the candidates attempting the question numerically rather than algebraically) was to recognise that Darcie received 7.5% over the time of the investment and Ivan 6.6%; each of these earned M1. After that, methods often became poorly organised calculations, possibly involving 108, or attempting trials of 7.5% of an amount and, sometimes, 6.6% of the same amount. Too often the calculations were incorrect percentage calculations, e.g. 7.5% of £200 = 200 × 7.5.

The trial and improvement scheme did not provide additional credit for multiple attempts at different amounts.

Exemplar 3

This candidate represents one of the few to construct a complete solution.

After a faltering start with several errors, they finally achieve a correct statement

25					midway down the response. Initial statements have varying numbers of zeros after the decimal point; after seeing the correct 0.075 (of *x*) it becomes the incorrect 0.75 and there is similar uncertainty for 0.066, but this is condoned as transcription errors as the difference is then given correctly as 0.009 *x*. The rest of the method is correct, even though the order is uncertain, as presumably 0.009x = 108 comes before $\frac{108}{0.009}$, which is then repeated at bottom left.
			Total	**6**	
24			682.2	3	**M1** for 18 × 10.4 oe soi by 187.2 **M1** for 360 + 90 + 45 + *their* 187.2 oe

For row 24, the right column contains:

e.g. 180 × 1.04
May be ratio method with × 18 oe seen
Their 187.2 from attempt at first M1 and ≠ 180
Addition may be a series of sums or implied by a vertical list with number below
Accept 495 + *their* 187.2

Examiner's Comments

This question was less answered well than expected, although a significant number of good answers were presented. The best candidates answered it efficiently.

Less successful candidates multiplied 180 by 10.4 rather than 1.04. Candidates who were not successful generally knew they had to do something with 180 and 10.4, but were unsure which operation to use.

Some multiplied each of the quantities by 10.4 before adding and some added 360, 90, 45 and 10.4.

			Total	**3**	
25			45	3	

					M1 for [1 share =] $\frac{100-1}{3+8}$ oe and **M1** for *their* 9 × (5 or 8 and 3) oe or **M1** for one from	M1 may be implied by 9 [Jamal] 27 and [Layla] 72 implies M1M1 *Their* 9 from $\frac{100-1}{3+8}$ or $\frac{100+1}{3+8}$ or $\frac{100}{3+8}$ may be decimal

[Jamal]	[Layla]
15	40
18	48
21	56
24	64

Examiner's Comments

This was answered quite well. Many used a diagrammatic approach successfully. Those candidates who began by completing 99 ÷11 were usually successful, though some candidates carried out 99 ÷11 and stopped there.

Candidates who were not successful often calculated 3 + 8 = 11, but then multiplied 3 and 8 by 11.
Others divided 100 (or 99) by 3 or 8.

		Total		**3**		

| 26 | | 7963.2[0] | | 4 | **B3** for 17036.8[0] or 3000, 2640 and 2323.2[0]

or

M2 for 25 000 × 0.88³ or 25000 × 0.12 and *their* 22000 × 0.12 and their 19360 × 0.12
or
M1 for 1 − 0.12 | |

implied by 0.88 or 25000 × 0.12 and *their* 22000 × 0.12 may be implied 3000 and 2640 or by 22000 and 19360

Examiner's Comments

Few candidates gained full marks. Although the formula for compound interest was given on the formulae sheet, many did not adapt it for a reduction. Several attempted to subtract 12% per year. A significant number calculated 12% of the starting cost as 3000, but then considered this 3000 as the decrease for each year and subtracted 9000.

			Total		**4**	

| 27 | | | 800 | 3 | **M2** for 160 × 2 × 2.5 oe

 or

 M1 for [flour=] 160 × 2 may be implied by 320 <br> or [flour=] 160 ÷ 10 × 2 may be implied by 32 <br> or [butter=] 160 ÷ 10 × 25 may be implied by 400

 or 25 ÷ 10 soi 2.5 | eg $\frac{160}{10} \times 2 \times 25$

 320g flour [in 10 cookies]

 32g flour [in 1 cookie]

 400g butter [in 25 cookies] |

Examiner's Comments

More able candidates answered this question well and achieved full marks, usually by setting out their response in three-part ratio form for butter, flour and sugar (often in columns). Another successful approach was to work out the amount of flour needed for 10 cookies, then 20 and 5 cookies before finally adding the appropriate amounts to find the correct total. Less successful responses often

					involved use of the total number of parts (i.e. 7).
		Total		**3**	
28			No, and [£]103.8[0] or No and 59.5 or 59.53 to 59.54 with correct working	4	**M1** for 44.98 ÷ 26 may be implied by 1.73 or 60 ÷ 26 may be implied by 2.3... **M1** for 103 ÷ *their* 1.73 or 60 × *their* 1.73 or 44.98 ×*their* 2.3... *their* 1.73 must come from a division of 44.98 **A1** for 59.5 or 59.53 to 59.54 or 103.8[0] or 103 .45 to 103.9[0] Allow explanations with rounding of 59.53 to 59.54 **Examiner's Comments** Many scored 4 marks, usually for 'No' and 103.8. It was rare to see 60 ÷ 26. Some scored M1 for 1.73 but could not make further progress. Only a small number who had calculated 103.8 gave the response 'Yes'.
		Total		**4**	
29			2 : 5	2	Accept 1 : 2.5, 0.4 : 1 **B1** for any correct ratio not in simplest form 12 : 30 etc may be in working **Examiner's Comments** Many correct answers were seen. The most common error was to stop cancelling at 6 : 15, perhaps because 15 is not divisible by 2.

						⟨?⟩ **Misconception**	
						A common misconception is that numbers cannot be cancelled by factors other than 2. Exemplar 1 12 : 30 6 : 15 (b) ....6...........: ....15........... [2] This response gained 1 mark.	
		Total	**2**				
30			3.1[0] with correct working	6	**B5** for answer 3 or 3.101 to 3.102 with correct working OR **M2** for [simple] [£] [760 +] $\frac{760 \times 2 \times 5}{100}$ **oe** **soi** 836 or **M1** for $\frac{760 \times 2}{100}$ **oe soi** 15.2[0] and **M2** for [compound] [£] 760×1.02^5 **oe soi** 839.1[0] or **M1** for 760×1.02^k **oe** (*k* positive integer) If **0** or **1** awarded, instead award **SC3** for answer 3.1[0] or ⁻3.1[0] OR **SC2** for an answer that rounds to	Correct working requires evidence of at least **M1** and **M1** With correct working, accept ⁻3.1[0] for **6 marks** and ⁻3.101 to ⁻3.102 for **B5** May be implied by 76 **nfww** See Appendix for non-calculator methods with values not 76, 836 or 15.2 May be 760 × 1.02^5 − 760 **soi** 79.1… Implied by 790.7…or 806.5...or 822.6... etc.

					3.1[0] or to ⁻3.1[0]	With no working or insufficient working
			Total	**6**		
31	a		1 : 5	2	**M1** for 12 : 60 **oe** seen or 2 mm : 1 cm seen	For **M1** condone common units included in "correct" ratio e.g. 1 mm : 5 mm or 12 mm : 60 mm or 1.2 cm : 6 cm
	b		1.75 or $1\frac{3}{4}$ or $\frac{7}{4}$ **oe**	1		Accept any equivalent fraction Condone answer 1 : 1.75 **oe**
			Total	**3**		
32	a		Correct comment implying addition or 7 parts and $\frac{3}{7}$	2	**B1** for each	Mark the best bit if no contradiction Accept denominator should be 7 Condone add them to get $\frac{3}{7}$ Accept she hasn't added them with 3 + 4 = 7 seen Expect no reference to numerator but, if referenced, must be 3.

Statement Reason Mark
She should have used 7 *Correct, though stronger with "as denominator"* **1**
She should have added the parts *Correct* **1**
3 + 4 = 7 *Sufficient to highlight the mistake* **1**
She adds the[m] both up [she gets 3/7] *BOD as implication of addition of 3 and 4* **1**
She needs to add the numbers to get the bottom *BOD as implication of addition of 3*

					and 4 **1** She adds 3 and 4 to get 7 *Clear what is added* **1** She didn't add up the total amount of money given *Ignore the reference to the amount of money and mark the "adding"* **1** She hasn't added the ratios together *BOD implies adding shares/parts* **1** She has only split the money into quarters [and not sevenths]] [or fourths] *Nina's error is correctly highlighted* **1** She has not figured out the total she has based it on the ratio *BOD total implies adding* **1** She has forgotten to solve out how much money there is *No implication of adding* **0** She only used the numbers in the ratio *No indication of the error made* **0**
	b		210	3	**M2** for $\frac{90}{3} \times (3 + 4)$ or 90 + 120 or **M1** for $\frac{90}{3}$ **soi** 30 or [Kareem] 120	Accept 7 for 3 + 4 30 may be multiplier in ratio method: e.g. 3 : 4 × 30 90 : 120 × 30
		Total		**5**		
33	a		1.28	2	**M1** for 1.60 ÷ 5 [× 4] **oe** or for 160 ÷ 5 [× 4] **oe** If **0** scored, instead award **SC1** for answer of 128 on answer line	Condone 128p as final answer in working space or answer line if £ sign is crossed out for **2** marks
	b		£4.20	3	**B2** for 420 or 4.34 or 4.2 OR **M2** for 7 × *their* 0.6 or 60 × *their* 7 or 0.6 × *their* 7	**isw** rounding after 4.20 **3** marks *Their* 0.6 can be 60, 62, 0.62 only *Their* 7 can be 7.3

					or **B1** for one of 7 or 60 or 0.6	or 7.5 only Condone trailing 0s after rounding e.g. 7.0
		Total		**5**		
34			9 : 14 final answer	2	**B1** for 45 : 70 or **B1FT** for *their* **(a)** : 70 or 45 : *their* 70	Where *their* 70 is between 65 and 75 inclusive
		Total		**2**		
35			600	3	**M1** for a correct conversion of litres to millilitres **M1** for figs 16 ÷ (3 + 5) [×3] If **0** scored **SC1** for answer 600 : 1000 or for answer figs 6	e.g. **M1** implied by 1600 with no further conversions
		Total		**3**		
36			6 hours 15 minutes	4	**B3** for 6.25 **oe** or for answer 6 h 25 min OR **M2** for 5 × 40 ÷ 32 or **M1** for 5 × 40 may be implied by 200	
		Total		**4**		
37	a		9	3	**M2** for $90 \times \frac{30}{20} \div 15$ **oe** or **M1** for $90 \times \frac{30}{20}$ **oe** may be implied by	May be done in stages Do not award 3 for answer 9 from rounded values

					135 or for 90 ÷ 15 may be implied by 6	
	b		48 with correct working	4	**M1** for 250 ÷ 100 implied by 2.5 **M1** for 1200 ÷ 500 implied by 2.4 AND **M1** for 20 × *their* 2.5 or 20 × *their* 2.4 OR **M1** for 100 ÷ 20 implied by 5 **M1** for 500 ÷ 20 implied by 25 AND **M1** for 1200 ÷ *their* 25 or 250 ÷ *their* 5 OR **M3** for 250 g [of sultanas] = 50 [scones] and 1200 g [of flour] = 48 [scones] OR **M3** for 240 g [of sultanas] = 48 [scones] and 1200 g [of flour] = 48 [scones] OR **M2** for 250 g [of sultanas] = 50 [scones] and 1250 g [of flour] = 50 [scones] If **0** or **1** scored, instead award **SC2** for answer 48 with no or insufficient working	Correct working requires at least the first two **M1** marks Must have a comparison of flour and sultanas

			Total		7	
38			2160 with correct working		5	**Method 1** **M3** for $\dfrac{360}{5 \times 0.04}$ oe may be implied by 1800 or **M2** for $\dfrac{360}{0.04}$ oe or $\dfrac{360}{5} \div 4$ or $\dfrac{360}{4} \div 5$ or **M1** for $\dfrac{360}{5}$ or $\dfrac{360}{4}$ or $\dfrac{P \times 4 \times 5}{100} = 360$ oe AND **M1dep** for *their* 1800 + 360 OR **Method 2 Trials** **M2** for two complete trials bracketing 360 and resulting in 360 ±10 or **M1** for one complete trial ≠ 360 If **0** or **1** scored, instead award **SC2** for 2160 If **0** scored, **SC1** for £1661[.64]	Correct working for 5 marks requires evidence of at least **M2** N/C methods need labels or operators oe 360 = 1800 × 5 × (0.04 or 4 / 100) or $\dfrac{360}{20}$ × 100 or N/C e.g. 4% = 72, 1% = 18, 100% = 1800 or 20% = 360, 10% = 180, 100% = 1800 or 20% = 360, 360 × 5 = 1800 or or 1 year = 90, 1% = 18, 100% = 1800 NB 360 × 5 = 1800 **alone** scores **M0** May be implied by 9000 or 18 or N/C e.g. 4% = 72, 1% = 18 or 20% = 360, 10% = 180 May be implied by 72 or 90 or N/C e.g. 4% = 72 or 20% = 360 "May be implied" tells you to look for the correct working associated with these values *Their* 1800 dependent on **M3** and not spoiled Trials must show

substitution and evaluation e.g.
1850 × 0.04 × 5 oe = 370
1750 × 0.04 × 5 oe = 350

e.g. 500 × 0.04 × 5 oe =100

with no working or insufficient working

When candidates say "4% =" they should mean "4% of the amount invested ="
and not "4% of 360 ="
Make a professional judgement if this is correct.
360 × 1.04 or 360 × 0.04 are good indicators of error.

4% of 360 = 14.40 and then 14.40 × 5 = 72 is **wrong method** because they are finding 4% of the interest and not 4% of the original amount.

In the examples below, the M marks are earned by the statement **with those** preceding it.
Not just for the statement.
In some methods, **M2** evidence can never seen

360 ÷ 5 (= 72)	**M1** or	20% = 360	
		4% = 72	**M1**
(72) × 25 = (1800)	**M3** or	100% = 1800	**M3**

360 ÷ 5 (= 72) **M1** or 20% = 360

4% = 72 **M1**

(72) ÷ 4 (= 18) **M2** or 1% = 18 **M2**

(18) × 100 = (1800) **M3** or 100% = 1800 **M3**

360 ÷ 4 (= 90) **M1** or 20% = 360

1 year = 72 **M1**

(90) ÷ 5 (= 18) **M2** or 1% = 18 **M2**

(18) × 100 = (1800) **M3** or 100% = 1800 **M3**

360 ÷ 20 (= 18) **M2** or 20% = 360

1% = 18 **M2**

(18) × 100 = (1800) **M3** or 100% = 1800 **M3**

360 ÷ 4 (= 90) **M1** or 20% = 360

5% = 90 **M1**

(90) ÷ 5 (= 18) **M2**

(18) × 100 = **M3** or 100% = 1800 **M3** (1800)

360 × 100 = (36000) or 20% = 360

(36 000) ÷ 5 = 7200 **M1** 5% = 90 **M1**

500% = 9000

(7200) ÷ 4 = 1800 **M3** 100% = 1800 **M3**

Note: the scheme say "May be implied by 72" but, as shown in the example above, 72 can come from wrong method. 72 is a good guide to look for supporting evidence to judge if the figure comes
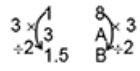
					from correct method.	
					Examiner's Comments In this 'You must show your working' question, more successful candidates organised and/or annotated their work so that it was clear that they were using a correct method to answer the question. Misreads and misinterpretations were common. Many candidates attempted compound interest, which received zero marks. Others misinterpreted the information and began by finding 4% **of** 360, which is an incorrect method. This however did lead to 14.40 and then 72, which is also a value that appeared in correct methods and so examiners were looking to the method used to award marks. Similarly, some candidates just wrote 5 × 360 = 1800 with no supporting evidence. As this can come from the incorrect assumption '£360 per year for 5 years', again examiners needed to look to supporting evidence to know that a correct chain of reasoning had been used. Some candidates mixed incorrect attempts with correct ones without distinguishing which they favoured, or which had been used to reach the final answer. Candidates are advised to cross out rejected working and to practise setting out answers logically.	
			Total	**5**		
39			250	2	**M1** for 207.5 ÷ 0.83 oe implied by figs 25[0]	**M1** may be implied by a list, 0.83, 1.66, 2.49,… but must reach 207.5 or beyond
					Examiner's Comments Around half the candidates got the correct	

					answer. The common error was to multiply by the exchange rate, leading to 172.225.	
		Total		**2**		
40	a	C		1		If nothing on answer line look for clear indication in list Allow $\frac{3}{4} \times 14$ on answer line **Examiner's Comments** Many candidates gave the correct answer of C. Some wrote their calculation on the answer line rather than the letter, but this was accepted if correct. The common incorrect responses were A and D, but B was also given by some.
	b	3.5[0]		2	**M1** for $\frac{1}{4} \times 14$ oe	e.g. 0.25 × 14 or 14 ÷ 2 ÷ 2 or 4 × 3.5 = 14 etc but not $\frac{1}{4}$ of 14 **M1** for − 14 − $\frac{3}{4}$× 14 May be seen as 14 − 10.5 **Examiner's Comments** Candidates who chose the incorrect answer in part (a) often did not get this right, but many gave the correct answer. '$\frac{1}{3}$ × 14' was a common incorrect method. Some responded with 10.50.
		Total		**3**		
41	a	[0]8 34 oe		2	**B1** for 14 [minutes]	Accept any recognisable time format e.g. full stop, colon,

						gap and inclusion of am but not pm
						Examiner's Comments A significant number of candidates correctly answered this and most showed their working. Good understanding of time, distance and speed was demonstrated, as well as usually time given in a correct format too. Candidates were rarely awarded 1 mark out of the 2 since most that reached the B1 for '14 [minutes]' carried on to a fully correct answer. Less successful responses treated 'doubling speed' as 'doubling time', leading to a common incorrect response of 09:16. Poor arithmetic and careless errors were seen occasionally both here and the following part (b).
b		21		3	**FT** *their* time added to 8.20 leading to answer in (a) or stated as cycling time in (a)	No FT if working not shown in (a) but **if 9.16 is answer in (a)** working does not need to be seen to FT **Example** *Their* time in (a) is 56 then [cycling =] (56 ÷ 2 =) 28 for **B1** [walking =] (28 ÷ 2 =) 14 **M1** for 28 + 14 **3 marks** for answer 42 (check (a) = 9.16 or cycle time = 56) Here 28 ÷ 2 = 14 minutes to walk half the distance
					B1 for 7 [minutes cycling]	Must be

					or *their* cycle time in (a) ÷ 2	correctly evaluated

M1 for *their* cycle time in (a) ÷ 2 + 14

Examiner's Comments

Quite a number of candidates correctly found the journey time as 21 minutes from 7 + 14, but a significant number made mistakes with halving and doubling.

Many of those who in part (a) had the incorrect response '09:16' did manage to calculate the correct times here and gained full marks. Those who had made other misconceptions in part (a) generally did not score here, but a few who had given clear working in (a) did pick up 'Follow Through' marks.

A common incorrect method was to halve the cycle time yet not halve the walking time.

08:41 (from 08:20 + 21) or the correct 'Follow Through' time were sometimes given as answers, but rarely.

Stronger responses clearly labelled 'walking time' and 'cycling time' and showed how they found them, which helped them avoid confusion.

			Total	**5**		
42			24 [kg] 12 [kg]	2	**B1** for each or **M1** for 44 ÷ 5.5 may be implied by 8 or 36 ÷ 4.5 or 36 ÷ 1.5	Accept working in g but final answer must be correct 8 used in multiplication or division e.g. 8 ÷ 2 then added to 8 Method may be seen with multipliers as e.g.

Examiner's Comments

A significant number of candidates answered this correctly, though often not showing any working.

A common error was to give 18 and 18, but there was no discernible pattern to the wrong answers.
Some values given did not sum to 36.

A surprisingly large minority did not attempt the question.

			Total	**2**	

| 43 | | | $\frac{23}{50}$ **oe** with correct working | 5 | **M1** for 50 – 10 – 1

M1 for *their* 39 ÷ (2 + 1)

A1 for 13 or 26

AND
B1 for answer $\frac{23}{k}$
or answer $\frac{p}{50}$

If 0 or 1 scored, instead award **SC2** for answer of $\frac{23}{50}$ **oe** | <u>Correct working requires evidence of at least **M1M1A1**</u> isw conversion/cancelling after correct answer seen
Do not accept ratio or words

All method marks may be seen on Diagram

M1 implied by 39

M1 implied by 13 Repeated addition/subtraction see appendix 26:13 or 13:26 implies **M1M1A1**

Where *k*>23 and an integer
Where *p*<50 and a positive integer

Algebraic method see Appendix 5 |

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Algebraic method

Allow any 2 different letters to represent 'only car' and 'only bike'.

M1 $b + c = 39$ or $2c = b$
M1 $3c = 39$ or $3b = 78$
A1 $b = 26$ or $c = 13$

AND

B1 for answer $\frac{23}{k}$ or answer $\frac{p}{50}$

Examiner's Comments

A good proportion of candidates picked up marks here, often M1M1A1 and often subsequently B1 too.

Many candidates showed the use of 'bus stop' method when completing $\frac{39}{3}$. Some however disregarded the 1 and attempted $\frac{40}{3}$.

Where the B1 was given, it was almost always for $\frac{p}{50}$ rather than $\frac{23}{k}$.

Poorer responses often attempted to divide 50 into the ratio 2 : 1, although some of these were able to go on to give a fractional answer with 50 as the denominator, scoring the B1.

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		Total	**5**		
44		1200 × 1.05 **oe** or 1200 × 0.05 **oe** 1260 or 60 or 1.1025 1260 × 1.05 **oe** or 1260 × 0.05 **oe** or 60 × 1.05 **oe** or 60 × 0.05 **oe** 60 and 63 or 1323	M1 B1 M1FT A1	**M1FT** for *their* 1260 × 1.05 **oe** or *their* 1260 × 0.05 **oe** or *their* 60 × 1.05 **oe** or *their* 60 × 0.05 **oe**	e.g. 10% = 120, 5% = 60 We do not allow mis-reads in this question **M1M1** implied by 1200 × 1.05² **oe** **M1FT** implied by 1323 or 63 or 3 For method we do not accept e.g. 105% × 1200 or 5% of 1200

| | | | | | **A1** dep **M1B1M1** | |

Examiner's Comments

Many calculated 5% of 1200 correctly and were given M1B1, however a high proportion of these then went on to treat the question as simple interest and multiplied this result by two (often accompanied by a statement that 'Charlie did not receive £123 interest'). Candidates should realise that if they don't arrive at a value that they have been asked to 'Show', it likely means they have made an error in their response.

Some candidates employed the formula given on the formulae sheet, but errors were often made in the addition of 1 and $\frac{5}{100}$ or calculating 1.05^2.

Some attempted to work backwards from the £123 rather than using the £1200.

| | | **Total** | | **4** | |

| 45 | | 525 | | 4 | **M3** for $\frac{7 \times 60 \times 15}{12}$ oe OR **M2** for $\frac{7 \times 60}{12}$ oe may be implied by 35 or for $\frac{60 \times 15}{12}$ oe may be implied by 75 OR **M1** for $\frac{15}{12}$ may be implied by 1.25 or for $\frac{12}{15}$ may be implied by 0.8 or for 7 × 60 may be implied by 420 or for $\frac{60}{12}$ may be implied by 5 | eg **M3** for 420 × 1.25 or 420 ÷ 0.8 or 7 × 75

eg **M2** for 7 × 5 or 60 × 1.25

M3 and **M2** may be seen in stages |

Examiner's Comments

Many candidates were given full marks on

						this question. The most common approach was to calculate the number of boxes made in 1 hour (75) and multiply this by 7. Some calculated 75, but did not know how to progress further. Some didn't respond or produced non-logical calculations that suggested they didn't know how to answer the question.
			Total		**4**	
46			75 with correct working		5	**M1** for $\frac{9}{10} \times 400$ oe may be implied by 360 or 90% AND **B2** for 300 or **M2** for $\frac{their\,360}{6} \times 5$ oe or $\frac{90}{6} \times 5$ OR **B1** for 60 or 15% or **M1** for $\frac{their\,360}{6}$ or $\frac{90}{6}$ AND **M1** for $\frac{their\,300}{400}$ [× 100] oe If **0** or **1** scored, instead award **SC2** for answer 75 with no or insufficient working "Correct working" requires evidence of at least **M1** AND **M1** 100% = 400, 1/10 = 10% = 40 400 – 40 = 360 Award **B2** for 60 : 300 or 300 : 60 *Their* 360 must come from use of 400 *Their* 300 must come from an attempt at a correct method **Examiner's Comments** This question required candidates to show their working and the majority of those who reached the correct answer showed sufficient working to gain full marks. Of those who didn't reach full marks, most found that 360 points were scored by the midfielders and the forwards, but many

					struggled to share this into the ratio 1 : 5 (often dividing 360 by 5 rather than 6).
			Total	**5**		
47			$\frac{4}{7}$ 15	1 2	**B1** for 5 or 35 or **M1** for 3 : 4 = *n* : 20 oe or for 20 ÷ 4 If **0 or 1** scored instead award **SC2** for correct values in incorrect place	May be embedded within a longer valid calculation eg 20 ÷ 4 × 3 or 20 ÷ 4 × 7 [– 20]
					Examiner's Comments Many candidates were given all 3 marks (often without any working seen). Of those who were not given 3 marks, many were given 1 for $\frac{4}{7}$. Candidates were very rarely given 2 marks; if they did it was usually from giving $\frac{4}{7}$ and stating either 5 or 35 when attempting to work with ratio.	
			Total	**3**		
48			2 : 5	1		If colon not used do not accept 2.5 Accept 1 : 2.5 or 0.4 : 1
					Examiner's Comments Many candidates gave the correct response to this. Others realised that both 14 and 35 were multiples of 7, but made an error in their calculations (giving an answer such as '7 : 5').	
			Total	**1**		
49	a		9.17 cao	3	**M2** for 5.24 × $\frac{7}{4}$ oe or	May be in pence 5.24 × 1.75 May be in pence e.g. 131

					M1 for $\frac{5.24}{4}$ oe may be implied by 1.31	
	b		6	2	**M1** for $\frac{18}{3}$ oe	
			Total	**5**		
50	a		2 : 5	2	**M1** for 16 : 40 or 8:20 or 4 : 10 or 1 : 2.5 or 0.4 : 1 If 0 scored, **SC1** for answer 5 : 2	Ignore incorrect cancellation once a correct, partially simplified ratio seen Ratio must have colon **and not** "to" or comma

	b		6.25	2	**M1** for any correct ratio not 1 : ...
					    or statement 16 cm = 100 cm oe
					    or (figs 10) ÷ 16
					or
					B1 for answer 1 : 6.25
					
					If 0 scored, **SC1** for answer [0].625
						e.g. 16 : 100, 8 : 50 or 4 : 25 or 2:12.5 or 0.16 : 1

			Total	**4**		
51			5	4	**M3** for $\frac{460-400}{3 \times 400}$ [× 100] **oe** or **M2** for $\frac{460-400}{3}$ **oe** or for $\frac{460-400}{400}$ **oe** or **M1** for 460 − 400 or $\frac{460}{400}$ or for $\frac{400 \times r \times 3}{100}$ **oe**	Eg $\frac{20}{400}$[× 100] or implied by [0].05 M2 implied by 20 or [0].15 or 15% M1 implied by 60 or 1.15
			Total	**4**		
52			800 with correct working	6		

					M1 for 3 × 1.30 + 2 × 0.85 **oe** or 3.9[0] + 1.7[0] **A1** for 5.6[0] AND **M1** for (8 – *their* 5.6[0]) **oe** **A1** for 2.4[0] AND **M1** for *their* 2.4[0] ÷ 1.2[0] [× 400] **A1FT** for *their* 2.4[0] ÷ 1.2[0] rounded down × 400 If **0** or **1** scored, instead award **SC2** for answer 800 with no or insufficient working If **0** scored, instead award **SC1** for 2.4[0] with no or insufficient working	"Correct working" requires evidence of at least two M marks and one A mark Allow working in pence provided consistent units used 5.6[0] implies M1A1 Could be implied by *their* 5.6[0] + *their* 2.4[0] + *their* 'change' [= 8.0[0]] Implied by list 1.2[0], 2.4[0], [3.6[0], …] up to one less than *their* 2.4[0] or Embedded 2 × 1.2[0] = 2.4[0] <u>Alternative Method</u>: For first M1A1 M1A1 M1 for 8 - 3 × 1.30 or 8 - 2 × 0.85 A1 for 4.1[0] or 6.3[0] AND M1 for 8 - 3 × 1.30 - 2 × 0.85 or *their* 4.1[0] - 2 × 0.85 or *their* 6.3[0] - 3 × 1.30 A1 for 2.4[0]
			Total	**6**		
53			462	4	**M2** for $\left(\frac{550}{5}\right)$ × 7 oe, may be implied by 770	

				Or **M1** for $\frac{550}{5}$ oe, may be implied by 110 **M1** for *their* $\left(\left(\frac{550}{5}\right)\times 7\right)\times$ 0.6	
		Total	**4**		
54			3906.78	3	**M2** for 3000 × (1.045)⁶ oe, may be implied by 3906.780… **M1** for 3000 × (1.045)ᵏ (*k* ≠ 6 and *k* ≥ 2)	oe includes 3000 $\left(1+\frac{4.5}{100}\right)^6$ May be done as separate years, mark method, condone premature rounding
		Total	**3**		
55			Incorrect, they have divided not multiplied [£]	1	**Response Mark** Incorrect/wrong with: You need to multiply not divide **1** You need to multiply **1** Pound is worth more than a euro therefore you have to × it **1** Need to times **1** 1.14 × 340 = 387.6 so she would have 387.6 euros instead of 298.25 **1** £340 = €387.6 **1** €298.25 = £261.62 **1** 1.14 is higher than 1 so £340 should be higher than itself **1** 1.14 is more than 1 so euros should be higher than pounds **1** It should be 387.6 **1 bod** €1 is worth more than £1 so she should get a higher answer – *first part incorrect* **0** Should be higher than 298.25 **0** The pound is valued more meaning the amount of money Eve has is wrong **0** Euro is worth more than pound **0**	
		Total	**1**		
56			5 : 2	1		

The mark scheme uses M marks (method marks) and includes alternative methods (oe = or equivalent) for the calculations shown.

			Total		1	
57	a		Yes and $\frac{69}{70}$ or 0.98[...] or 98% AND is less than 1 **oe** or is not equal to 1 **oe** or They will have money left **oe**		2	**M1** for $\frac{1}{2}+\frac{1}{5}+\frac{2}{7}$ **soi** $\frac{69}{70}$ or 0.5 + 0.2 + 0.28[…] **soi** 0.98[...] or 50[%] + 20[%]+ 28[…%] **soi** 98[...%]	Accept 'No' [as some left over] throughout for 'Yes' Accept equivalent fractions, decimals or percentages Allow using an amount of money. Check *their* total or difference for **2 marks** If comparing fractions, must have common denominator or numerator. Accept e.g. $\frac{9.8[...]}{10}$ for $\frac{69}{70}$ **M1** for $1-(\frac{1}{2}+\frac{1}{5})$ **soi** $\frac{3}{10}$ and for **2 marks** Yes $\frac{2}{7}<\frac{3}{10}$ or $\frac{14}{70}<\frac{15}{70}$ **M1** for $1-(0.5+0.2)$ **soi** 0.3 and for **2 marks** Yes $\frac{2}{7}=0.28[...]<0.3$ or **M1** for $1-(\frac{1}{2}+\frac{2}{7})$ **soi** $\frac{3}{14}$ and for **2 marks** Yes $\frac{1}{5}=\frac{14}{70}$ $\frac{3}{14}=\frac{15}{70}>\frac{14}{70}$ **oe**
	b		160		2	**M1** for $280 \times \frac{2}{7}$ [×2] **oe soi** 80	e.g. $\frac{4}{7} \times 280$ or $560 \times \frac{2}{7}$ or $560 \times 0.28[..]$ or 280×2 [= 560] and

						[*their* 560] ÷ 7 = [*their* 80]
		Total		**4**		
58		22 000 × 0.85 × 0.9 **oe** [final value =] 16 830		M3 B1	**M2** for 22 000 × $\frac{100-15}{100}$ **oe** **soi** 18 700 or **M1** for 22 000 × $\frac{15}{100}$ **oe** **soi** 3300 and **M1** for *their* 18 700 × $\frac{100-10}{100}$ **oe**	Allow subtractions the wrong way round if intention clear For non-calculator methods, see Appendix N/C methods allow layout to imply addition Labels (correct (incorrect values) values) e.g. **M1** 10% = 2200 **M0** 10% = 2250 ✗ 5% = 1100 5% = 1125 15% = 3300 15% = 3375 **M1** 10% = 2200 5% =1100 15% = 3350 ✗ Condone slip in addition Accept any value except 22 000 for *their* 18 700 After **M0** accept 22 000 for *their* 18 700 Accept 16 800 for **B1** after **M3**
		Total		**4**		
59	a	4 : 7		2	**B1** for 12 : 21 or 8 : 14 or seen or for answer 1 :1.75 or 0.57 to 0.58 : 1	Ignore incorrect cancelling once a correct, partially simplified ratio seen

	b		6	2	**M1** for $\frac{1}{7}\times 7$ or $1\div\frac{1}{7}$ or $\frac{6}{7}$ **oe** seen or **B1** for equivalent ratio to 6 : 1 **oe** seen	0.85[7..] or 85[.7..]% e.g. 12 : 2, 1 : $\frac{1}{6}$, 1 : 0.16[6..]
	c		5 **nfww**	3	**M2** for (4 × 20) ÷ 16 or **M1** for (4 × 20) implied by 80 or $\frac{20}{16}$ implied by 1.25 OR **M2** for 4 × 5 ÷ 4	From using the inverse of 20 days ÷ 5 × 4 to get 16 days
		Total		**7**		
60	a		12	2	**M1** for $\frac{400\times 3}{100}$ **oe**	Answer 412 implies **M1**
	b		460	2	**M1** for 400 + 5 × 12 **oe** or for 400 + 5 × *their* (a) **oe**	FT for **2** marks when *their* (a) is < 400
		Total		**4**		
61	a		Straight line Passes through origin	1 1	**Response Mark** It is a straight line through origin equal away from both total and hours worked **1 1** Straight line starting at the origin **1 1** Because there is a positive correlation and going up in a straight line **1 0** The charge is going up at a constant rate **1 0** It is a straight diagonal line **1 0** It increases at the same rate **1 Bod 0** It starts at 0 **0 1** Goes up at a steady incline **0 0** Because it is a positive gradient **0 0** As it goes straight through the middle - positive *middle of what?* **0 0** As the hours increase so does the price **0 0** Line straight across *across implies horizontal line* **0 0**

					The more hours they work the more money they get **0 0**		
	b		Straight line intercepting positive *y*-axis *Their* line drawn with a less steep gradient than the given line		1 1		Gradient ≠ 0 Min length 4 cm
			Total		**4**		
62			3.4[0]		2	**M1** for $\frac{1.19}{350}$ × 1000 **oe**	Breakdown/ build up methods must get to 1 kg exactly
			Total		**2**		
63			3		1		
			Total		**1**		
64			44 final answer		4	**B3** for 44.46 or 44.5 OR **M1** for 130 × 190 implied by 24 700 **M1** for *their* 130 × 190 ÷ 10 000 may be implied by 2.47 or 2 hectares and 4700 or 20 000 and 4700 **M1** for *their* 2.47 × 18 If **0** scored instead award **SC1** for answer 36	Allow alternate methods e.g. **M1** for 130 × 190 implied by 24 700 **M1** $\frac{10000}{18}$ = 555.5 rec or 556 **M1** for *their* $\frac{24700}{556}$ *Their* 2.47 must come from multiplication to find area
			Total		**4**		
65	a		60		1		
	b		No, they need 283 to 284 [g] with correct working or No they need 23 to 24 [g]		3		

			more with correct working OR No, they can only make 36[.7…] with correct working OR No, they need 7.08[3..] [g] but they only have 6.5 [g] **oe** with correct working		**M2** for *their* (40 ÷ 12) × 85 **oe** or **M1** for 40 ÷ 12 or 3.3… or implied by repeated addition reaching 36 or 85 ÷ 12 or 7.08[3..] or implied by repeated addition reaching 84 OR **M2** for *their* (260 ÷ 85) × 12 **oe** or **M1** for 260 ÷ 85 implied by repeated addition reaching 255 or repeated subtraction reaching 5 and 3 OR **M1** for 260 ÷ 40 or 6.5 **M1** for 85 ÷ 12 or 7.08[3..] or implied by repeated addition reaching 84	Implied by 85 × 3 = 255 and 3 × 12 = 36 Implied by 85 × 3 = 255 Implied by repeated addition reaching 240 or repeated subtraction reaching 20 and 6
			Total	**4**		
66			No, with full supporting evidence	5	**B2** for 196 or **M1** for 245 × 0.8 oe AND	"Full supporting evidence" requires **B2M2** or **M2M2** Non-Calculator methods e.g. 245 ÷ 10 = [ ], [ ] × 8 = 196 **M1**

					M2 for $\frac{245-5}{13+2+1}\times$ 13 soi 195 or **M1** for $\frac{245-5}{13+2+1}$ soi 15 __Alternative Method__ **M2** for $\frac{245-5}{13+2+1}\times$ 13 soi 195 or **M1** for $\frac{245-5}{13+2+1}$ soi 15 AND **M2** for $\frac{their\ 195}{245}\times$ 100 soi 79.59 … or 0.8 and 0.7959 … seen or **M1** for $\frac{their\ 195}{245}$ soi 0.7959 …	Allow $\frac{240}{16}$ for $\frac{245-5}{13+2+1}$ If using 245 for 240, *their* 195 will be 199[. ...]
		Total	**5**			
67	a		He has not used [masses in] the same units or correct example of amounts e.g. [1 g and] 3 g [of flour] or 1 kg [of butter] [and 3 kg]	1		Accept amounts for masses The units are mixed/not the same Do not accept "measurements" for "units" but may be clarified later Mark the best part if no contradiction **Reason Judgement Mark** He should have converted the kg into grams Correct **1** He only put a gram of butter when it should have been a kilogram Correct **1** He used g and kg and these should be the same Allow these referring to units **1** He only used 1 g but it should be 1 kg Correct example **1** He should have used 3 g of flour Correct example of matching units **1**

					The measurements should be 1000 g and 3000 g Correct example in correct order If order incorrect must tell us which is butter/flour **1** He should have used 1000 g and 3 kg Correct example even though using mixed units **1** He added too little butter because he measured in different units The first part is correct but would, on its own, not get the mark **1** Azmi has used the wrong units as he has used the ratio 1 : 3000 Allow example of the ratio he has used An alternative would be 0.001 : 3 **1** He didn't put the ratio back to the original numbers Incorrect as "original" undefined **0** They are different amounts of measurements Do not accept amounts or measurements for units **0** They should have made the conversions the same Should be 'should have made the units the same' **0** He only used 1 g of butter No comparison **0** He used 1 g and it's too small No comparison **0** They got the units wrong Does not say that the units should be the same **0** He added too much flour and he measured in different units First part is incorrect so award 0 **0**
	b		1 : 4	2	**B1** for $\frac{1}{5} : \frac{4}{5}$ or 5 : 20 or 10 : 40 or 0.2 : 0.8 If 0 scored **SC1** for answer 4 : 1	Must be a ratio to earn marks
		Total		**3**	
68			144	2	**M1** for $\frac{600 \times 4 \times 6}{100}$ oe If 0 scored, **SC1** for answer 744	Any attempt at compound interest scores 0 M1 May be in stages e.g. 600 × $\frac{4}{100}$ = 24 and 24 × 6

						M1 Allow 6 × 4 × 6 or 24 × 6
			Total	**2**		
69			131	4	**M1** for 395 × 1.13 soi by 446.35 **M1** for (*their* euros) – 281.29 **M1** for *their* 165.06 ÷ 1.26 oe	165.06 implies **M1M1** Must be linked to 395 but do not accept 395 as euros May be *their* 165.06 × 0.793[...]
			Total	**4**		

70			52	3	**M2** for 39 ÷ 3 × 4 oe or 39 + 13
					or
					M1 for 39 ÷ 3 oe may be soi by 13
					
					OR
					breakdown method
					B2 for 39 associated with $\frac{3}{4}$ and
					        13 associated with $\frac{1}{4}$
					
					or
					
					B1 for 39 associated with $\frac{3}{4}$ or
					        13 associated with $\frac{1}{4}$
						Do not accept e.g. 39 × $\frac{3}{4}$
						May be shown e.g. on a bar model
						
						39 associated with $\frac{3}{4}$ and 9.75 associated with $\frac{1}{4}$ scores 0

			Total	**3**		
71			120	3	**M2** for 160 ÷ 4 × 3 or **M1** for 160 ÷ 4 soi by 40 nfww	
			Total	**3**		
72			2 : 3 final answer	2		

					B1 for any ratio equivalent to 3 : $4\frac{1}{2}$ except 3 : 4.5 and 3 : $\frac{9}{2}$	2 marks for 1 : 1.5 or 1 : $\frac{3}{2}$ or $\frac{2}{3}$: 1 For B1 isw
		Total	**2**			
73			195	4	**B1** for 50 [adults] and **M2** for 30 × 1.5 + (*their* 50) × 3 soi or **M1** for 30 × 1.5 or (*their* 50) × 3	For M2 and M1 *their* 50 must be an integer The addition may be implied by *their* answer May be implied by 45 May be implied by *their* 150
		Total		**4**		
74	a		Correct, labelled pie chart with correct working	6		"correct working" requires at least **M1M1 and ruled line** If there are labelled angles, mark the method that leads to the angles If angles are not shown mark worst method
					M2 for 360 − (140 + 80 + 30) oe or **M1** for 140 + 80 + 30 AND **M1** for $\frac{3}{5}$ × *their* 110 oe **A1** for 66 or **M1** for $\frac{2}{5}$ × *their* 110	May be implied by 110 May be implied by 250 Mark to the candidate's advantage *Their* 110 < 360 66 implies M1A1

					oe **A1** for 44 AND **B1** for ruled line at 66° **B1** for *their* larger sector labelled 'bus' and smaller sector labelled 'car'	44 implies M1A1 Tolerance ± 2° only if correct working seen.
	b		Walk	1		
			Total	**7**		
75			5	3	**B1** for $y = \frac{k}{x}$ oe soi by $10 = \frac{k}{8}$ or $k = 80$ **M1** for $[y =] \frac{their\ k}{16}$ OR **M2** for $10 \times 8 = y \times 16$ or better or **M1** for 10×8 **Alternative method:** **M2** for $10 \div (16 \div 8)$ or **M1** for $16 \div 8$ If 0 scored **SC1** for answer of 20	e.g. for 2 marks $\frac{80}{16}$ oe Implied by 80 May be seen in a table: **M2** for × 2 oe and ÷ 2 oe or **M1** for × 2 oe × 2 | x	8	16
y	10		 ÷ 2
			Total	**3**		
76			12	2	**M1** for any valid complete method e.g. $100 \div 25 \times 3$ oe	For M1 accept 25, 50, 75,… [up to] 300 or 300, 275,

					soi by 4 × 3 or 300 ÷ 25	250,… [down to] 0 with one arithmetic slip condoned
		Total		**2**		
77		56 nfww		4	**B2** for length of rectangle = 10 Or **M1** for 6 ÷ 3 × 5 **M1** for 6 × 6 + 2 × *their* length **oe**	
		Total		**4**		
78	a	5:12		2	**M1** for correct partial simplification of 125 : 300	e.g. 25 : 60, but not e.g. 2.5 : 6 1 : $2\frac{2}{5}$ **oe** scores **M1**
	b	240		2	**M1** for 30 ÷ 20 × 160 **oe**	
	c	Answer of 55		4	**M3** for 220 ÷ 80 × 20 **oe** Or **B2** for 60 or 11 [eggs] **and** 220 Or **M1** for 220 ÷ 80 or 12 ÷ 4 **soi**	For **M3** allow a table with just one error
		Total		**8**		
79		441.84 cao		4	**B3** for 8441.84 **soi** or for 441[.8…] as final answer Or **M3** for (8000 × 1.009^6) – 8000 Or **M2** for 8000 × 1.009^6 **oe** implied by 8441[.84…] or 8000 × r^6 – 8000 **oe** Or **M1** for 8000 × 1.009^n **oe** implied by	Answers of 432 and 8432 are from simple interest and score 0 For **M2** and **M1** where r = 1.9, 1.09 or 1.009

					8144[.64…] ($n \neq 6$ and $n \geq 2$) or 8000 × r^n **oe** ($n \geq 2$)	
		Total		**4**		
80	a		€195 < €216 or £162.5[0] < £180 with correct working	4	Allow exchange rates of 1.15 to 1.25 leading to €207 to €225 or £156 to £170 **M2** for 195 ÷ 1.2 or 180 × 1.2 **A1** for [£]162.5[0] or [$]216 Or **M1** for a correct exchange rate e.g. 24 ÷ 20 OR **M2** for building up to € equivalent of £180 or £ equivalent of €195 e.g. 18 × 10 or 9 × 20 or 18 × 12 or 9 × 24 **A1** for [£]162.5[0] or [€]216 Or **M1** for building up to £180 or €195 e.g. 18 × 10 or 9 × 20 or 16.25 × 12 or 180 ÷10 = 18 OR **M2** for 195 ÷ 12 and 180 ÷ 10 **A1** for 16.25 and 18 Or **M1** for 195 ÷ 12 = 16.25 or 180 ÷ 10 = 18 If **0** scored **SC1** for $195 < (€207 to €225) or (£156 to £170) < £180 with no or insufficient	Comparison in symbols or words required Allow FT *their* value from (b) Allow correctly rounded values used for **M** marks e.g. for £8.33 or £8 for €10 used

					working, but not wrong working	
	b	21 or FT *their* (c)	1 dep		Dep on **A1** or **SC1** awarded in part (c)	Accept 20.99
		Total	**5**			
81		0.15 0.05	4		**B3** for 0.05 OR **M2** for 1 – (0.3 + 0.2 + 0.3) **soi** by 0.2 in working or two values in the table which sum to 0.2 Or **M1** for 0.3 + 0.2 + 0.3 **soi** by 0.8 in working **M1** for *their* 0.2 ÷ 4	Accept percentages or fractions
		Total	**4**			
82	a	5 with correct working	3		**M1** for 280 – *n* where 45 ≤ *n* ≤ 55 **soi** by 225 to 235 **M1** for (*their* number of characters) ÷ 45 Alternative method **M2** for two from [5 letters] 280 ÷ 6 [6 letters] 280 ÷ 7 [7 letters] 280 ÷ 8 Or **M1** for one from [5 letters] 280 ÷ 6 [6 letters] 280 ÷ 7 [7 letters] 280 ÷ 8 Alternative method (trials) **M2** for two from 4 × 45 + [45 to 55] 5 × 45 + [45 to 55] 6 × 45 + [45 to 55] Or **M1** for one from 4 × 45 + [45 to 55] 5 × 45 + [45 to 55]	Correct working requires at least **M1** *n* represents an estimate of the number of spaces and/or punctuation, digits, symbols etc.

				6 × 45 + [45 to 55] OR **M1** for 280 ÷ 45 **A1** for final answer of 6 If **0** scored and no/insufficient working, **SC1** for answer 5	Allow 45 × 6 = 270 for **M1** Answer '5 to 6' or 6 with no working scores **0**
	b		84 [seconds] $\frac{45}{60}$ × *their* 84 **oe** or $\frac{48}{their\ 84}$ × 60 **oe** OR 1.4 **oe** 45 × *their* 1.4 **oe** or 48 ÷ *their* 1.4 AND 63 or 34.[2…] and long/longer word length **oe**	B1 M1 B1 M1 A1		**oe** may be $1\frac{24}{60}$ **oe** *their* 1.4 is not 1.24 Ignore non-contradictory statements but, 'She may type slower' is incorrect and, if included, scores **A0**
		Total		**6**		
83		4		2	**M1** for 8 ÷ 2 **oe**	
		Total		**2**		
84		5 : 7		3	**B1** for 28 or (*their* 48 – 20) **M1** for 20 : *their* 28 OR **M2** for $\frac{5}{12} : \frac{7}{12}$ seen Or **M1** for $\frac{20}{48} : \frac{28}{48}$ **oe** seen	*Their* students from (c) *Their* 28 is any value from 13 to 47 May be on answer line For **M1** ratio must be seen and not implied from a 'simplified' version 20 : 28 implies **B1**

					If **0** scored, **SC1** for answer 7 : 5	**M1** 28 : 20 implies **B1 oe** 0.416[…] : 0.583[…]
		Total		**3**		
85	a	Correct comment implying addition or 5 parts and $\frac{2}{5}$		2	**B1** for each	Mark the best bit if no contradiction See appendix Accept denominator should be 5 Condone add them to get $\frac{2}{5}$ Accept he hasn't added them with 2 + 3 = 5 seen Expect no reference to numerator but, if referenced, must be 2.

For further detail, please refer to 2023 November, J560/03, Mark Scheme Appendix.

Examiner's Comments

Most candidates attempted this question and many successfully gained at least one mark. Most realised that Dev should have added the 2 and 3 to form the denominator, but some struggled to express this coherently. Many gave the correct fraction.

Assessment for learning

Candidates should practice giving coherent reasons, utilising evidence from the text.

						These reasons should then be presented to candidates' peers for constructive review.
	b		250	3	**M2** for $\frac{100}{2} \times (2 + 3)$ or 100 + 150 or **M1** for $\frac{100}{2}$ soi 50 or [Emma] 150 **Examiner's Comments** Most candidates who attempted this scored one or more marks. The common error was to divide 100 by 5 and not 2.	Accept 5 for 2 + 3 50 may be multiplier in ratio method: e.g. 2 : 3 ×50 100 : 150 ×50
			Total	**5**		
86			2.2[0] with correct working	6	**B5** for answer 2 or 2.203 to 2.204 with correct working OR **M2** for [simple] [£] [540 +] $\frac{540 \times 2 \times 5}{100}$ oe soi 594 or **M1** for $\frac{540 \times 2}{100}$ oe soi 10.8[0] and **M2** for [compound] [£] 540 × 1.02^5 oe soi 596.2[0] or **M1** for 540 × 1.02^k oe (*k* positive integer)	Correct working requires evidence of at least **M1** and **M1** With correct working, accept -2.2[0] for **6 marks** and -2.203 to -2.204 for **B5** May be implied by 54 nfww See appendix for non-calculator methods with values not 54, 594 or 10.8 May be 540 × 1.02^5 – 540 soi 56.2...

| | | | | | If **0** or **1** awarded, instead award **SC3** for answer 2.2[0] or ⁻2.2[0] OR **SC2** for an answer that rounds to 2.2[0] or to ⁻2.2[0] | Implied by 561.8…or 573.05...or 584.5... etc with no working or insufficient working |

Examiner's Comments

This unstructured question allowed many candidates to score one or two marks and with a significant number receiving all six.

Methods seen were often inefficient, although some stronger candidates used the compound interest formula (provided on the formulae sheet that was given to candidates this series) correctly and showed efficient, well organised working.

Candidates could often find the value of either the simple or compound interest investment correctly, to receive part marks. Very few used multipliers when working with the percentages, but the simplicity of the percentage figures meant that candidates were usually successful.

Those that made errors with the simple interest often successfully found 2% of 540 and added it to 540, but then either stopped or multiplied their (540 + 2%) by 5.

A few candidates wasted a great deal of time attempting to calculate compound interest using noncalculator methods. These also usually involved premature rounding, leading to the final answer being out of tolerance.

			Total	**6**		
87	a		5 : 1	2	**M1** for 40 : 8 oe seen or 1 cm : 2 mm seen	For M1 condone common units included in "correct" ratio e.g. 5 mm : 1

						mm or 40 mm : 8 mm or 4 cm : 0.8 cm
						Examiner's Comments Many candidates had problems with this question and few were given marks. The common wrong answer was 1 : 2, from ignoring the units. Another common mistake was 4 : 80, from incorrectly changing mm to cm by multiplying by 10 (many similar variations of incorrect unit changing were also seen, such as 40 : 80). Responding with 1 cm : 2 mm was often seen and this scored a special case mark.
	b		1.25 or $1\frac{1}{4}$ or $\frac{5}{4}$ oe	1		Accept any equivalent fraction Condone answer 1 : 1.25 oe **Examiner's Comments** This question was answered slightly better than (a) but was still a challenge for many candidates. Common wrong answers were 2 and 0.8.
			Total	**3**		
88			£5.60	3	**B2** for 560 or 5.84 or 5.6 OR **M2** for 8 × *their* 0.7 or 70 × *their* 8 or 0.7 × *their* 8 or **B1** for one of 8 or 70 or 0.7	Isw rounding after 5.60 3 marks *their* 0.7 can be 70, 73, 0.73 only *their* 8 can be 8.2 or 8.5 only Condone trailing

						0's after rounding e.g. 8.0
						Examiner's Comments Most candidates rounded at least one of the numbers correctly. Rounding 8.2 kg to 8 kg was done well, however a few rounded to 9 kg instead. A few candidates did not show their rounding of 73p in the working space and went onto complete 8 × 7 = 56. Struggles with place value were also evident, with responses of £0.56, 56p or £56 seen. The most common issues were candidates not rounding 73p to 1 significant figure and just using 73p in a calculation, or not acknowledging the request to round at all and attempting 8.2 × 73. ⟳ **Assessment for learning** Candidates should show their rounded numbers **before** they use them in calculations. Here, a first step should have been: 8.2kg ≈ 8kg 73p ≈ 70p
		Total		**3**		
89		7 : 11 final answer		2		**B1** for 35 : 55 Or **B1FT** for *their* (a) : 55 or 35 : *their* 55 Where *their* 55 is between 50 and 60 inclusive **Examiner's Comments** Most candidates correctly identified the values of 35 and 55 and wrote them as a ratio. Many were also able to write this in its simplest form, however the common error

					seen was leaving the ratio as 35 : 55. Some candidates incorrectly simplified the ratio to 6 : 11 or 5 : 9. There were also a few candidates that incorrect read the amount of rainfall in March from the bar chart.
			Total	**2**	
90			2.25	2	**M1** for 1.80 ÷ 4 [× 5] oe or for 180 ÷ 4 [× 5] oe If 0 scored **SC1** for answer of 225 on answer line ⎪ Condone 225p as final answer in working space or answer line if £ sign is crossed out for 2 marks. **Examiner's Comments** Most candidates were able to access the question, with many being given full marks. The most common method seen was to find the unitary price using the 'bus stop' method. Candidates then either added the cost of one apple on to £1.80, or multiplied the cost by 5. The most common misconceptions were to divide £1.80 by 5 instead of by 4, or to multiply £1.80 by 5.
			Total	**2**	
91			600	3	**M1** for a correct conversion of litres to millilitres ⎪ eg **M1** implied by 1500 with no further conversions **M1** for figs 15 ÷ (2 + 3) [×2] If **0** scored **SC1** for answer 600 : 900 or for answer figs 6 **Examiner's Comments** Many candidates showed some

			understanding of ratio and shared the given total into 5 parts. A common error was instead to either multiply or divide the given total by both 2 and 3, producing two values that were then stated to be the quantities of red and yellow paint. Several candidates made errors when converting between ml and litres, for example using 100 ml in a litre, while others omitted the conversion entirely. Successful candidates mostly first divided by 5 (× 2) and then multiplied by 1000.		
		Total	**3**		
92		6 hours 15 minutes	4	**B3** for 6.25 oe or for answer 6 h 25 min OR **M2** for 6 × 50 ÷ 48 or **M1** for 6 × 50 may be implied by 300 **Examiner's Comments** (?) **Misconception** 0.25 hours is not equivalent to 25 minutes. Few candidates were able to give the correct response. Several gained 3 marks for 6 hours 25 minutes, or responding with 6.25 hours without converting the .25 of an hour into 15 minutes. Others calculated 50 × 6 = 300, but were unable to make further progress.	
		Total	**4**		
93	a	7	3	**M2** for $70 \times \frac{24}{16} \div 15$ oe or	May be done in stages

				M1 for $70 \times \frac{24}{16}$ oe may be implied by 105 or for $70 \div 15$ may be implied by 4.66 to 4.7	Do not award 3 for answer 7 from rounded values
				Examiner's Comments Candidates used a variety of methods on this question. A common, successful method was to halve the amount for 16 and add it on to find the total amount of milk. Some candidates then went on to divide by 15, although others gave the final answer as 105. Premature rounding in the calculation led to an inaccurate final response.	
	b	40 with correct working	4	**M1** for $240 \div 80$ implied by 3 **M1** for $1000 \div 400$ implied by 2.5 AND **M1** for $16 \times$ *their* 2.5 or $16 \times$ *their* 3 OR **M1** for $80 \div 16$ implied by 5 **M1** for $400 \div 16$ implied by 25 AND **M1** for $1000 \div$ *their* 25 or $240 \div$ *their* 5 OR **M3** for 240g [of sultanas] = 48 [scones] and 1000g [of flour] = 40 [scones] OR **M3** for 200g [of sultanas] = 40[scones] and	Correct working requires at least the first two **M1** marks Must have a comparison of flour and sultanas

					1000g [of flour] = 40 [scones] OR **M2** for 240g [of sultanas] = 48 [scones] and 1200g [of flour] = 48 [scones] If **0** or **1** scored, instead award **SC2** for answer 40 with no or insufficient working **Examiner's Comments** Many candidates had considered both flour and sultanas and were able to be given full marks. A few candidates stated 1 kg = 100 g.	
			Total	**7**		
94	a		No and $\frac{73}{70}$ or 1.04[…] or 104% AND is greater than 1 oe or is not equal to 1 oe or He won't have enough money oe	2	Not "It's improper fraction" or "Top heavy" **M1** for $\frac{1}{2} + \frac{2}{5} + \frac{1}{7}$ soi $\frac{73}{70}$ or	Accept equivalent fractions, decimals or percentages Allow using an amount of money. Check *their* total or difference for 2 marks If comparing fractions, must have common denominator or numerator. Accept e.g. $\frac{10.4[...]}{10}$ for $\frac{73}{70}$ May be

0.5 + 0.4 + 0.14[…] soi 1.04[...]

or

50[%] + 40[%] +14[...%] soi 104[...%]

M1 for $1 - \left(\frac{1}{2} + \frac{2}{5}\right)$ soi $\frac{1}{10}$

and for **2 marks**

No $\frac{1}{7} > \frac{1}{10}$ or $\frac{10}{70} > \frac{7}{70}$

or

M1 for 1 – (0.5 + 0.4) soi 0.1

and for **2 marks**

No $\frac{1}{7} = 0.14[...] > 0.1$

or

M1 for $1 - \left(\frac{1}{2} + \frac{1}{7}\right)$ soi $\frac{5}{14}$

and for **2 marks**

No $\frac{5}{14} = \frac{25}{70}$ $\frac{2}{5} = \frac{28}{70} > \frac{25}{70}$

oe

Examiner's Comments

The best responses added the fractions and found the total $\frac{73}{70}$, or 1.04. They then compared this to 1 or said that there was not enough money to share.

Some candidates converted to three fractions with a denominator of 70 (or to decimals or percentages), but then did not show an addition or total. Others took an amount of money and found the fractional values of it, but again did not add these. Without a total, saying that Sundip would not have enough money was incomplete and marks could not be scored.

Candidates need to understand that when asked to explain or show working, then parts of the method cannot be left incomplete. Examiners cannot do the work for candidates and deduce missing figures.

					The most common correct answer was to say that Sundip does not have enough money (following, for example, 1.04) rather than comparing their total to a whole. Almost three quarters of candidates were not able to explain whether the plan could work. Some weaker responses stated that it was unfair as they did not all get the same amount.
	b		256	2	**M1** for $320 \times \frac{2}{5}$ [× 2] oe soi 128 e.g. $\frac{4}{5} \times 320$ or $640 \times \frac{2}{5}$ or 640×0.4 or 320×2 [= 640] and [*their* 640] ÷ 5 = [*their* 128] **Examiner's Comments** This question was a little better answered and around a third of candidates gained 2 marks. Those who worked out the total to be £640 generally did well. A common error was to find $\frac{2}{5}$ of 320 (rather than 640), which scored M1.
		Total		**4**	
95			17 000 × 0.85 × 0.9 oe [final value =] 13 005	M3 B1	**M2** for $17\,000 \times \frac{100 - 15}{100}$ oe soi 14 450 or Allow subtractions the wrong way round if intention clear For non-calculator methods, see appendix N/C methods allow layout to imply addition

	Labels
	(correct (incorrect values) values)

M1 for $17\,000 \times \frac{15}{100}$ oe soi

2550

	e.g. **M1**	**M0** 10%
	10% =	= 1750
	1700	✘
	5% =	5% =
	850	875
	15% =	15% =
	2550	2625

and

M1
10% =
1700
5 % =
850

✘
15% =   Condone
1550   slip in
  addition

M1 for *their* $14\,450 \times \frac{100 - 10}{100}$ oe

Accept any value except 17 000 for *their* 14 450

After **M0** accept 17 000 for *their* 14 450

Accept 13 000 for **B1** after **M3**

Examiner's Comments

More able candidates often scored marks here. The percentages required were relatively benign, so those candidates who used inefficient non-calculator techniques were often able to get the correct figures (although often wasted time doing so).

A number of candidates added the percentages and suggested that the overall decrease was 25%, scoring no marks.

Some candidates correctly found 10% of 17 000 (1700), then 5% of 17 000 (850) and

					then reduced 17 000 by the resulting 15% (2550), but then for Year 2 reduced this value by 10% of 17 000 rather than 10% of itself. Few candidates showed operations when using non-calculator methods, so a slip in arithmetic would mean method marks couldn't be awarded. Very few candidates wrote 'Year 1 = 17 000 × 0.85 = £14 450 and Year 2 = 14 450 × 0.9 = £13 005'. A number of candidates made transcription errors and wrote values such as 2250 for 2550 and 13 050 for 13 005, leading to loss of accuracy marks.
		Total		**4**	
96	a		3 : 7	2	**B1** for 9 : 21 or 6 : 14 or seen or for answer 1 : 2.3[3...] or 0.42 to 0.43 : 1 — Ignore incorrect cancelling once a correct, partially simplified ratio seen **Examiner's Comments** This straightforward question was answered well and many correct answers were seen. A significant number gained 1 mark for a partial simplification. Some candidates could not divide 42 by either 2 or 3 correctly.
	b		4	2	**M1** for $\frac{1}{5} \times 5$ or $1 \div \frac{1}{5}$ or $\frac{4}{5}$ oe seen — 0.8 or 80% or **B1** for equivalent ratio to 1 : 4 oe seen — e.g. 2 : 8, $\frac{1}{4}$:1, 0.25 : 1

				2	**Examiner's Comments** Stronger candidates answered the question well. A number gained 1 mark for finding $\frac{4}{5}$, 0.8 or 80%. The common wrong answer was 5.
	c		5 nfww	3	**M2** for $(3 \times 25) \div 15$ or **M1** for (3×25) implied by 75 or $\frac{25}{15}$ implied by 1.6 to 1.7 OR **M2** for $3 \times 5 \div 3$ NB The following are wrong methods and score **M0** $25 \div 3 = 8.33...$ and then $15 \div 8.33... = 1.8$ rounded to 2 So $3 + 2 = 5$ Also $15 \div 3 = 5$ and also $25 \div 5 = 5$ From using the inverse of 25 days $\div 5 \times 3$ to get 15 days **Examiner's Comments** This question challenged many candidates and only around a fifth used a valid method and gained full marks. An answer of 5 was often reached, but in many cases from an incorrect method that could not be credited. Many carried out either $15 \div 3 = 5$ or $25 \div 5 = 5$, both of which are wrong methods and scored M0. Some calculated $25 \div 3 = 8.333...$, then $15 \div 8.333... \approx 2$ followed by $3 + 2 = 5$, which also scored 0.
		Total		7	
97	a		14	2	

					M1 for $\frac{700\times2}{100}$ **oe**	Answer 714 implies M1
						Examiner's Comments This simple interest question was a challenge for many candidates. Responses often attempted the calculator method of '700 × 1.02'. Candidates often used labels such as '10% =' in their working, but rarely wrote the operation they were using to arrive at their values. Candidates who therefore realised they required 1%, but arrived at an incorrect value, had not shown the required method to score the method mark available. An answer of 714 was commonly seen, scoring M1.
	b		742		2	**M1** for 700 + 3 × 14 **oe** or for 700 + 3 × *their* (a) **oe** FT for 2 marks when *their* (a) is < 700 **Examiner's Comments** The majority of candidates who gave a correct answer in part (a) were able to answer part (b) correctly. Those who gave 714 in part (a) often gave 42 as an answer in part (b), scoring 0. Those candidates who had written 700 × 1.02 in part (a) often attempted compound interest calculations in part (b). The most common answer here was to multiply their answer to part (a) by 3, but not add it to 700, which scored 0.
		Total			**4**	
98	a		Straight line Passes through origin		1 1	**Response** For additional information refer to **2023**

	b					**June (J56001) Mark scheme Appendix** within downloadable additional mark guidance. **Examiner's Comments** Few candidates gave an explanation identifying that the graph was a straight line from the origin. Some did state that it was a straight line. Many thought the question was related to scatter graphs.
	b		Straight line intercepting positive *y*-axis Their line drawn parallel to given line	1 1		Gradient ≠ 0 Min length 4cm **Examiner's Comments** Many candidates did not attempt this part of the question. Those who did make an attempt often drew a diagonal line from the origin. A common misconception seemed to be that the line should be steeper (perhaps confusing the fixed charge with a higher rate).
			Total	**4**		
99			3.2[0]	2	M1 for $\frac{1.44}{450}\times 1000$ oe	Breakdown/ build up methods must get to 1kg exactly **Examiner's Comments** Candidates who used a complete calculator method usually gave the correct answer. Many candidates made the question harder by doubling £1.44 to get the cost of 900 g, then struggled to work out how to find the cost of the remaining 100 g.
			Total	**2**		
100			43 final answer	4	**B3** for 43.2	Allow alternate methods e.g.

OR

M1 for 120 x 180 implied by 21600

M1 for 120 x 180 implied by 21600

M1 for *their* 120 x 180 ÷ 10000 may be implied by 2.16

M1 $\frac{10000}{20}$ =500

or 2 hectares and 1600 or 20 000 and 1600

M1 for *their* $\frac{21600}{500}$

M1 for *their* 2.16 × 20

Their 2.16 must come from multiplication to find area

If **0** scored instead award **SC1** for answer 40

Examiner's Comments

The majority of candidates made an attempt to answer this question. Candidates who scored well on this question were most often the ones who had a logical structured approach to their answer and showed all steps taken. Most candidates realised that since the field was rectangular they needed to multiply the sides together and many did so correctly to reach 21 600. At this point, some then proceeded correctly by dividing by 10 000 to reach 2.16 hectares. Some attempted to subtract 20 000, but often did not show the remaining figure of 1600 that was needed along with this to score the M1 mark. Candidates who showed 21 600 ÷ 10 000 = 2.16 and rounded this to 2 fared better, but often did not show 2 × 20 = 40.

Of the few candidates who did correctly carry out 2.16 × 20 to get to 43.2, some did not realise the 'difficulty' in having 0.2 of a sheep and gave 43.2 as the answer, while others incorrectly rounded up to an answer of 44. Those who took the approach of
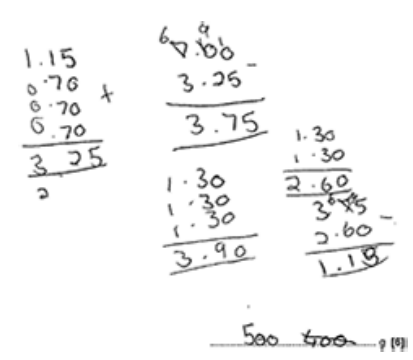
					finding that each sheep required 500 m² usually reached a successful conclusion.
		Total	**4**		
101	a	4	1		**Examiner's Comments** Most candidates gave the correct answer of 4 to this question.
	b	90	1		**Examiner's Comments** The majority of candidates gave the correct answer of 90. The most common incorrect answer was 60.
	c	No, they need 566 to 567 [g] with correct working or No they need 46 to 47 [g] more with correct working OR No, they can only make 73[.4...] with correct working OR No, they need 7.08[3..] [g] but they only have 6.5 [g] oe with correct working	3	**M2** for *their* (80 ÷ 24) × 170 oe or **M1** for 80 ÷ 24 or 3.3… or implied by repeated addition reaching 72 or 170 ÷ 24 or 7.08[3..] or implied by repeated addition reaching 168 OR **M2** for *their* (520 ÷ 170) × 24 oe or **M1** for 520 ÷ 170 implied by repeated addition reaching 510 or	 Implied by 170 × 3 = 510 and 3 × 24 = 72 Implied by 170 × 3 = 510

						repeated subtraction reaching 10 and 3	
						OR	
						M1 for 520 ÷ 80 or 6.5	Implied by repeated addition reaching 480 or repeated
						M1 for 170 ÷ 24 or 7.08[3..] or implied by repeated addition reaching 168	subtraction reaching 40 and 6
						Examiner's Comments The more able candidates used a complete method, however some rounded prematurely, leading to an answer outside the required range of accuracy and scoring 2 marks. A common error was candidates believing only complete batches of 24 cookies could be made.	
			Total		**5**		
102	a		6.3[0] cao		3	**M2** for $3.78 \times \frac{5}{3}$ oe or **M1** for $\frac{3.78}{3}$ oe may be implied by 1.26 **Examiner's Comments** Responses were usually correct with just the occasional numerical error. Candidates usually showed working and so could gain method marks if such an error occurred. It was clear that calculators were not always used, and written methods were sometimes shown.	May be in pence 3.78 × (1.66 or 1.67 or 1.66...) May be in pence e.g. 126

					Most candidates showed each step of their working. Some candidates found the price of 2 loaves by doubling the 1.26 and then added this onto the 3.78 given. M2 was given to those who used a correct method but did not get the 1.26. Those who scored 0, usually multiplied 3.78 by 3.
	b		10	2	**M1** for $\frac{20}{2}$ oe **Examiner's Comments** This question was answered quite well but 40 minutes was the modal incorrect answer.
		Total		**5**	
103	a		2 : 5	2	**M1** for 14 : 35 or 4 : 10 or 1 : 2.5 or 0.4 : 1 If 0 scored, **SC1** for answer 5 : 2 Ignore incorrect cancellation once a correct, partially simplified ratio seen Ratio must have colon **and not** "to" or comma **Examiner's Comments** A large number of candidates scored 1 mark for some simplification of 28 : 70 in ratio form. A fairly common incorrect response was 7 : 10.

	b		12.5	2	**M1** for any correct ratio not 1 : ...
					    or statement 8 cm = 100 cm oe
					    or (figs 10) ÷ 8
					or
					B1 for answer 1 : 12.5
					
					If 0 scored, **SC1** for answer [0].125 e.g. 8 : 100, 4 : 50 or 2 : 25 or 0.08 : 1
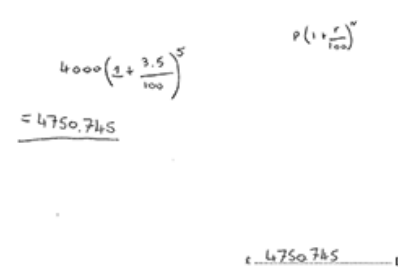
						Examiner's Comments Many candidates did not score any of the marks here. Those who did know what to do often thought that there are 1000 cm in 1 m. Many candidates appeared unsure of map scales. It was uncommon to see 8 : 100 but 1 : 800 and 8 : 800 did appear. Even when a ratio was seen, candidates were unsure how to get the value of *n*.
			Total		**4**	
104			400 with correct working		6	**M1** for 2 × 1.15 + 3 × 0.70 **oe** or 2.3[0] + 2.1[0] **A1** for 4.4[0] AND **M1** for (7 – *their* 4.4[0]) **oe** **A1** for 2.6[0] AND **M1** for *their* 2.6[0] ÷ 1.3[0] [× 200] **A1FT** for *their* 2.6[0] ÷ 1.3[0]

Right-hand commentary column (aligned to row 104):

"Correct working" requires evidence of at least two M marks and one A mark

Allow working in pence provided consistent units used

4.4[0] implies M1A1

Could be Implied by

their 4.4[0] + *their* 2.6[0] + *their* 'change'

[=7.0[0]]

Implied by list 1.3[0], 2.6[0], [3.9[0], ...] up to one less than *their*

					rounded down × 200	2.6[0] or Embedded 2 × 1.3[0] = 2.6[0]
						Alternative Method: For first M1A1 M1A1
						M1 for 7 − 2 × 1.15 or 7 − 3 × 0.70
						A1 for 4.7[0] or 4.9[0]
						AND
						M1 for 7 − 2 × 1.15 − 3 × 0.70
					If **0** or **1** scored, instead award	or *their* 4.7[0] − 3 × 0.70
					SC2 for answer 400 with no or insufficient working	or *their* 4.9[0] − 2 × 1.15 A1 for 2.6[0]
					If **0** scored, instead award **SC1** for 2.6[0] with no or insufficient working	

Examiner's Comments

Many candidates set out their working clearly, showing every step required to get to the correct answer, and many scored the full 6 marks. Some candidates did not provide a complete solution. As the question states 'You must show your working' it is essential to communicate each calculation required for each step, however simple they seem.

Errors seen included calculating the cost of 2 pineapples as £2.20 or working out 2 kg of banana. Some made errors subtracting £4.40 from £7 with the results £3.60 and £3.40 often seen. Many candidates avoided using division so £1.30 + £1.30 = £2.60 was commonly seen. Candidates who

					made an error in getting to their value of £2.60 were often able to gain follow through marks for finding their correct number of packets of strawberries and hence their correct weight. Some did not consider that strawberries were sold in 200g packs and incorrectly attempted to find an exact weight. '**You must show your working**.' A limited response in these questions can often be the difference between 2 or 3 marks and 6 marks. In Question 10, if 400g was seen with insufficient working the candidate scored 2 special case marks. These types of questions are in every examination series, so candidates should be made aware that all workings must be shown. Exemplar 1 In this response, the candidate has attempted to add pineapples and bananas, but they have only included one pineapple, so score M0A0. They proceed to subtract their total from £7 which scores M1. They then list multiples of £1.30 to find how many strawberries they could buy. This scores M1. The final answer of 500 is incorrect so this response scores a total of 2 marks. If the original answer of 400 had been given then a follow through A1 would have been scored.
		Total		**6**	
105		3		4	

					M3 for $\frac{690-600}{5\times600}$ [× 100] oe	Eg $\frac{18}{600}$ [× 100] or implied by [0].03
					or M2 for $\frac{690-600}{5}$ oe or for $\frac{690-600}{600}$ oe	M2 implied by 18 or [0].15 or 15%
					or M1 for 690 − 600 or $\frac{690}{600}$ or for $\frac{600\times r\times5}{100}$ oe	M1 implied by 90 or 1.15

Examiner's Comments

Candidates often found this question challenging because of its reverse nature. Two common approaches were seen. Some found the total amount of money for each year (£18) while others found the total percentage over the 5 years (15%). Most candidates who scored on this question were credited M2 for either 15% or £18. Several candidates scored M1 for finding the £90 of interest.

A few candidates attempted compound interest although simple interest was listed on the advanced information.

			Total	**4**		
106			840	4	**M2** for $\left(\frac{450}{3}\right)\times7$ oe may be implied by 1050 or **M1** for $\frac{450}{3}$ oe may be implied by 150 **M1** for *their* $\left(\left(\frac{450}{3}\right)\times7\right)\times0.8$	

Examiner's Comments

Many candidates knew how to start this question, dividing 450 by 3 for M1, but often did not progress further. Some managed to obtain 1050 for M2. A common misconception was to add the parts of the ratio together and then divide 450 by 10.

			Total	4	

					M2 for 4000 × $(1.035)^5$ oe may be implied by 4750.74 or 4750.745...	oe includes 4000 $(1+\frac{3.5}{100})^5$

107			4750.75	3	

M2 for 4000 × $(1.035)^5$ oe may be implied by 4750.74 or 4750.745...

oe includes 4000 $(1+\frac{3.5}{100})^5$

M1 for 4000 × $(1.035)^k$ ($k \neq 5$ and $k \geq 2$)

May be done as separate years, mark method, condone premature rounding.

Examiner's Comments

Many candidates gave the correct answer and gained full marks, others did not give their answer to the nearest penny. Other common errors included the use of 3.5^5, 1.35 and finding the interest for one year and multiplying by 5 (simple interest). Candidates that calculated the compound interest using a year-by-year approach often made more errors than those that used the formula. Candidates should be encouraged to use their calculator efficiently to answer questions of this type.

Exemplar 3

$$4000\left(1+\frac{3.5}{100}\right)^5$$

$$P\left(1+\frac{r}{100}\right)^n$$

$$= 4750.745$$

£ 4750.745 [3]

Candidates should make sure they answer the question fully. The final mark was not given as the answer had not been given to the nearest penny.

			Total	3	

					For additional information refer to **2022 November (J56001) Mark scheme Appendix** within downloadable additional mark guidance.
108			Incorrect, they have divided not multiplied [£]	1	

Examiner's Comments

					The most successful answers identified that the error in the given calculation was to divide rather than multiply. Many candidates could not express the given information correctly in words, so phrases, such as 'a dollar is worth more than a pound', were very common. Some candidates only checked the given calculation and stated 'correct'.
		Total		**1**	
109		2 : 3		1	**Examiner's Comments** This part was less well answered than the first part. Candidates sometimes tried to link it to the results from part (a) and did not always understand the connection between a fraction and a ratio. 2 : 5 was a common incorrect response.
		Total		**1**	
110		54		3	**M2** for 36 ÷ 2 × 3 oe or 36 + 18 or **M1** for 36 ÷ 2 oe may be soi by 18 OR breakdown method **B2** for 36 associated with $\frac{2}{3}$ and 18 associated with $\frac{1}{3}$ or **B1** for 36 associated with $\frac{2}{3}$ or 18 associated with $\frac{1}{3}$ Allow 0.66… to imply 2/3 Do not accept e.g. 36 × $\frac{2}{3}$ May be shown e.g. on a bar model 36 associated with $\frac{2}{3}$ **and** 12 associated with $\frac{1}{3}$ scores 0 **Examiner's Comments** This question proved to be one of the least accessible on the paper. Few established

				that yellow made up two thirds of the tiles and equated 18 to 1/3. The most common response was a value of 12 (from 36 ÷ 3) followed by 36 + 12 = 48.
		Total	**3**	
111		100	3	**M2** for 150 ÷ 3 × 2 or **M1** for 150 ÷ 3 soi 50 nfww **Examiner's Comments** One successful approach to this was using a bar model. Some did realise the need to divide £150 by 3. The most common error was to link the £150 to the 5 parts Blake had in the ratio and found that one part was equal to £30, leading to the common incorrect answer of £60.
		Total	**3**	
112		60	2	**M1** for $\frac{400 \times 3 \times 5}{100}$ oe If 0 scored, **SC1** for answer 460	Any attempt at compound interest scores 0 M1 May be in stages eg $400 \times \frac{3}{100} = 12$ and 12 × 5 M1 Allow 4 × 3 × 5 or 12 × 5

Examiner's Comments

Most candidates attempted this question although few gained full marks. Many wrote 3% of 400 = 12 rather than 0.03 × 400 = 12 or $\frac{3}{100} \times 400 = 12$ Candidates

should understand that "of" is not a mathematical operation and, if the answer is wrong, this style of working may not enable them to score method marks.

A number worked out one year's interest,

			added this to 400 and multiplied by 5. A number of candidates thought that 3% = 0.3. Some candidates misread the question and spent time calculating the value of £400 after compound interest was added.
		Total	**2**		
113		167	4	**M1** for 375 × 1.15 soi by 431.25 **M1** for (*their* euros) − 217.49 **M1** for *their* 213.76 ÷ 1.28 oe	213.76 implies **M1M1** Must be linked to 375 but do not accept 375 as euros May be *their* 213.76 × 0.781[...]

Examiner's Comments

This question was generally well answered and many candidates scored at least M2. Most candidates showed steps in working that could be followed to award method marks. Most candidates scored the first 2 marks for 375 × 1.15 and then subtracting 217.49. The most common errors were then to multiply by 1.28 or divide by 1.15.

Some candidates added 1.15 to 375 but could score a method mark for subtracting 217.49. Some attempted to change 217.49 using 1.15 or 1.28.

Some candidates rounded values as they worked through the steps or miscopied their own values and so lost accuracy marks.

		Total	**4**		
114		Yes, with full supporting evidence	5	**B2** for 175 or **M1** for 250 × 0.7 oe AND **M2** for $\frac{250-10}{11+3+1} \times 11$ soi 176	"Full supporting evidence" requires **B2M2** or **M2M2** Non-Calculator methods e.g. 250 ÷ 10 = [ ], [ ] × 7 =176 M1 Allow $\frac{240}{15}$ for $\frac{250-10}{11+3+1}$

or

M1 for $\frac{250-10}{11+3+1}$ soi 16

<u>Alternative Method</u>

M2 for $\frac{250-10}{11+3+1} \times 11$ soi 176

or

M1 for $\frac{250-10}{11+3+1}$ soi 16

AND

M2 for $\frac{their\ 176}{250} \times 100$ soi 70.4

or 0.7 and 0.704 seen
or

M1 for $\frac{their\ 176}{250}$ soi 0.704

If using 250 for 240, *their* 176 will be 183[. ...]

Examiner's Comments

It was pleasing to see a significant number of candidates score marks in this question. This was often for working out 70% of 250. However, many candidates used 70% of 250 as their working and, if they did not reach 175, did not score a method mark. Others went through the lengthy process of saying 50% =, 10% =, etc. These non-calculator methods are not efficient and candidates should be encouraged to use a calculator on this paper.

Some candidates divided 240 by the 15 parts of the ratio (and multiplied by 11) although some attempted to do this using 250. Some found 176 and then worked out that this was 70.4% of the members and so was sufficient to make the change.

A reasonably common error was to subtract 10 from 250 and then find 70% of 240. 168 often appeared incorrectly in answers.

A number of candidates ignored the ratio and thought that these were the numbers of votes counted, often concluding that not enough people had voted as only 11 votes

					were cast. Exemplar 3 250 - 10 = 240 168 must mate 240 ÷ 10 = 24 yes 24 × 7 = 168 11 + 3 + 1 = 15 240 ÷ 15 = 16 16 × 11 = 176 yes 16 × 3 = 48 no 16 × 1 = 16 not sure yes because 70% of 240 is 168 and 176 members voted "yes" therefore over 70% voted. .... [5] The candidate made the error of finding 70% of 240 rather than 250 and so could only score M2 for finding the number of votes from the ratio.
		Total		**5**	
115	a		He has not used [masses in] the same units or correct example of amounts e.g. [4kg and] 1kg [of butter] or 4g [of flour] [and 1g]	1	**Exemplar Responses** Reason Judgement Mark He should have converted the kg into grams Correct 1 He only put a gram of butter when it should have been a kilogram Correct 1 He used kg and g and these should be the same Allow these referring to units 1 He only used 1 g but it should be 1 kg Correct example 1 He should have used 4 g of flour Correct example of matching units 1 The measurements should be 4000 g and 1000 g Correct example in correct order If order incorrect must tell us which is butter/flour 1 He should have used 4 kg and 1000 g Correct example even though using mixed units 1 He added too little butter because he measured in different units The first part is correct but would, on its own, not get the mark 1 Rowan has used the wrong units as he has used the ratio 4000 : 1 Allow example of the ratio he has used An alternative would be 4 : 0.001 1

He didn't put the ratio back to the original numbers Incorrect as "original" undefined 0
They are different amounts of measurements Do not accept amounts or measurements for units 0
They should have made the conversions the same Should be, Should make units the same 0
He only used 1 g of butter No comparison 0
He used 1 g and it's too small No comparison 0
They got the units wrong Does not say that the units should be the same 0
He added too much butter and he measured in different units First part is incorrect so award 0 0

Accept amounts for masses
The units are mixed/not the same
Do not accept "measurements" for "units" but may be clarified later
Mark the best part if no contradiction

Examiner's Comments

This was moderately well done although some candidates found it difficult to express their reasoning. Many candidates mentioned wrong "measurements" or "amounts" rather than mixed/wrong "units" and did not score the mark. Some candidates were unaware of the number of grams in a kilogram and said that he had used the ratio 400 : 1 rather than 4000 : 1.

Assessment for learning

Candidates should practise writing reasons and reading these to others to improve their communication skills.

b		1 : 9	2	**B1 for** $\frac{1}{10} : \frac{9}{10}$ or 10 : 90 or 2 : 18 or 0.1 : 0.9 If 0 scored **SC1** for answer 9 : 1	Must be a ratio to earn marks

						Examiner's Comments This was not attempted by a number of candidates. Of those who did attempt it, the incorrect 1 : 10 was common. Few candidates scored part marks, often going straight to their answer. A small number scored 1 special case mark for the incorrect 9 : 1.
			Total	**3**		
116	a		Correct, labelled pie chart with correct working	6	**M2** for 360 − (160 + 60 + 20) oe or **M1** for 160 + 60 + 20 AND **M1** for $\frac{2}{5} \times$ *their* 120 oe **A1** for 48 or **M1** for $\frac{3}{5} \times$ *their* 120 oe **A1** for 72 AND **B1** for ruled line at 48° **B1** for *their* smaller sector labelled "bike" and larger sector labelled "car"	"correct working" requires at least **M1M1 and ruled line** If there are labelled angles, mark the method that leads to the angles If angles are not shown mark worst method May be implied by 120 May be implied by 240 Mark to the candidate's advantage *Their* 120 < 360 48 implies M1A1 72 implies M1A1 Tolerance ± 2° only if correct working seen.

Examiner's Comments

This question was well attempted and often resulted in full marks. A small minority didn't label their sectors or labelled incorrectly. Occasionally the only mark lost was for drawing the line on the pie chart in the wrong place after 48° or 72° seen. Most used a ruler, but some freehand lines, losing this mark, were seen. Those not

				scoring full marks often gained M2 for finding the remaining 120°. The most common error after this was to divide 120 by 2 and 3, leading to 60° and 40°. Others only did 120 ÷ 2 = 60 then assumed the other angle was also 60°. These candidates didn't consider the unequal aspect of the ratio while some that did gave the two sectors as 70° and 50°. Arithmetic errors when calculating 240° and 120° were made by some, however many went on to gain a further method mark for the next step of finding ⅖ and ⅗ of their 120°. Others used the ratio to 'count up' to find angles that summed to 120, e.g. 2 : 3, 4 : 6, 40 : 60, etc. rather than dividing by 5. Working out appeared less well set out in this question with some methods scattered all over the page.	
	b		Bus	1	**Examiner's Comments** Generally answered correctly, 160 was seen most commonly in place of a correct response. Train, the median rather than the mode, was sometimes seen and there were a few who did not attempt this part.
			Total	**7**	
117			5	3	**B1** for $y = \frac{k}{x}$ oe soi by $20 = \frac{k}{3}$ or $k = 60$ **M1** for $[y =] \frac{their\ k}{12}$ OR **M2** for $20 \times 3 = y \times 12$ or better or **M1** for 20×3 **Alternative method**: **M2** for $20 \div (12 \div 3)$ or M1 for $12 \div 3$ If 0 scored **SC1** for answer of 80 **Examiner's Comments**

For the right-hand column of row 117:

e.g. for 2 marks $\frac{60}{12}$ oe

Implied by 60

May be seen in a table:
M2 for × 4 oe and ÷ 4 oe
or **M1** for × 4 oe

	× 4	
x	3	12
y	20	
	÷ 4	

					Most candidates ignored the inverse proportionality aspect of this question with the majority working through the question by treating y as directly proportional to x, hence getting an answer of 80 was very common. This earned them 1 mark for identifying the multiplier of 4. Some used a table or arrows between the pairs of values of y and x. An algebraic method was very rarely seen. Other errors were $(20 − 3) = 1$, $17 + 12 = 29$ or starting with $20 ÷ 3 = 6.6$. There were a significant number of candidates who did not attempt this question.
			Total	**3**	
118			8	2	**M1** for any valid complete method e.g., $100 ÷ 25 × 2$ oe soi by $4 × 2$ or $200 ÷ 25$ For M1 accept 25, 50, 75, … [up to] 200 or 200, 175, 150 … [down to] 0 with one arithmetic slip condoned **Examiner's Comments** Most candidates were able to answer this correctly. Various methods were used, though the most common was by chunking 25s to a total of 200. A few struggled to add 25 repeatedly, with addition errors made. Others didn't keep a track of their chunking method, producing answers of 7 or 9. Those whose working was more chaotic often lost marks because they gained an extra banana or lost a banana as they started a new vertical column. Another successful method was to indicate that 4 could be purchased for £1 then doubled the amount for £2. Other common errors included when candidates were unsure of the total of 200p for £2, and working out an answer of 4 for £1 but then not doubling this for £2. **Assessment for learning**

					Candidates should be encouraged to recognise the pattern of the 25 times table, repeating every hundred, and how it relates to quarters as decimals and percentages.
		Total		**2**	
119		2 : 3 final answer		2	**B1** for any ratio equivalent to $5 : 7\frac{1}{2}$ except 5 : 7.5 and $5 : \frac{15}{2}$	2 marks for 1 : 1.5 or $1 : \frac{3}{2}$ or $\frac{2}{3} : 1$ For B1 isw **Examiner's Comments** Many found this question difficult due to the presence of a fraction in the given ratio. Quite often candidates just converted 7½ to 7.5 and stated their simplified ratio as 5 : 7.5. The most common methods seen among scoring candidates was either recognising that both sides could be divided by 2.5, or multiplying both sides to make sure two integers were used and then dividing down, e.g. multiplying by 2 to get 10 : 15 and then dividing by 5 to get 2 : 3. There were a significant proportion of candidates who gave answers of 1 : 1.5 or equivalent, therefore identifying that they needed to make one side of the ratio "1" to correctly simplify. Many who attempted to simplify by dividing both numbers by 2 first, either got to 2.5 : 3.75 but struggled to proceed, or made an error that led to 2.5 : 3.5.
		Total		**2**	
120		225		4	**B1** for 20 [adults] and **M2** for 50 × 2.5 + (*their* 20) × 5 soi or **M1** for 50 × 2.5 or (*their* 20) × 5	For M2 and M1 *their* 20 must be an integer The addition may be implied by *their* answer May be implied by 125 May be implied by *their* 100

Examiner's Comments

Most candidates attempted this question and many were able to score some method marks, even if their final answer was incorrect. Those who did not get the correct final answer and showed insufficient working often lost method marks. Many missed the cue to scale up the ratio and didn't realise they needed to work out how many adult tickets they needed before trying to calculate the cost. So, responses scored M2 for 2.50 × 50 + 5.00 × n, or just M1 for 2.50 × 50. A common approach was to use the ratio given and work out the cost of 5 children and 2 adults. Some who dealt with the ratio aspect successfully, struggled to multiply 2.50 by 50. Some attempted to split this into 2.50 × 5 then × 10 but without a calculator found this difficult.

Check the reasonableness of answers by use of estimation

Candidates would benefit from reinforcement of their understanding of place value in relation to such calculations. Some gave solutions with clearly incorrect magnitude. Candidates should therefore be encouraged to check their answers by estimation.

Their final answer comes from adding £37.50 and £50.00. This scores M2 for 50 × 2.5 + (their 20) × 5. Although arithmetic errors have been made, their communication supports correct steps of working. They have clearly labelled the number of adult tickets so we can see where 5 × 10 comes from and they have

					stated 2.50 × 50 even though they incorrectly calculate this as £37.50. Finally, they show the addition of their child ticket total and their adult ticket total. A total of 2 scored.
		Total		**4**	
121	a		4 with correct working	3	**M1** for 210 – *n* where 40 ≤ *n* ≤ 50 soi by 160 to 170 **M1** for (their number of characters) ÷ 40 Alternative **M2** for two from [4 letters] 210 ÷ 5 [5 letters] 210 ÷ 6 [6 letters] 210 ÷ 7 or **M1** for one from [4 letters] 210 ÷ 5 [5 letters] 210 ÷ 6 [6 letters] 210 ÷ 7 Alternative (trials): **M2** for two from 3 × 40 + [40 to 50] 4 × 40 + [40 to 50] 5 × 40 + [40 to 50] or **M1** for one from 3 × 40 + [40 to 50] or 4 × 40 + [40 to 50] or 5 × 40 + [40 to 50] OR **M1** for 210 ÷ 40 **A1** for final answer of 5 If 0 scored and no/insufficient working **SC1** for answer 4

(right-hand column continues)

Correct working requires at least M1
n represents an estimate of the number of spaces and/or punctuation, digits, symbols etc]

Allow 40 × 5 = 200 for M1

Answer "4 to 5" or 5 with no working score 0

Examiner's Comments

Candidates were more successful with part

						(a) than part **(b)**, but generally the question was not well answered. ⟳ **AfL** Practise solving and discussing problem solving question, considering strategies and conclusions. A number of candidates scored 2 marks in this part for dividing 210 by 40 and truncating the result to five letters, although some did not truncate and only scored 1 mark. Some tried forms of trial and improvement, but were rarely successful. Some multiplied 210 by 40.
	b		72 [seconds] $\frac{40}{60}\times their\ 72$ oe or $\frac{52}{their\ 72}\times 60$ oe OR 1.2 oe 40 × *their* 1.2 oe or 52 ÷ *their* 1.2 AND 48 or 43.[3…] and short/shorter word length oe	B1M1B1M1A1	oe may be $1\frac{12}{60}$ oe *their* 1.2 is not 1.12 Ignore non-contradictory statements but, "He may type faster" is incorrect and, if included, scores A0 **Examiner's Comments** In some conversions of time units were seen to score a mark. Some correct and creative solutions were seen, but these were very few in number. Some candidates just tried to write an explanation with no calculations to back it up.	
			Total	**6**		
122			5 : 6 nfww	4	B3 for 5*kn* : 6*kn* *k* > 0 or equivalent correct unsimplified ratio seen OR **M1** for two ratios with a common number of mints implied by … : 10*k*	Accept for all part marks *n* replaced by a consistent integer e.g. 2.5*n* : 3*n* or 5*n* : 6*n* or 10 : 12 etc May be seen as two separate ratios Eg 5*n* : 10 and 10 :

				and 10*k* : … seen, *k* > 0 with one correct ratio or 2.5n : 5 seen **A1** for 5*kn* : 10*k* : 6*kn*	6*n* or 10 : 20 and 20 : 12 etc For **M1** the examples just require the common 10 or the common 20 etc
				Examiner's Comments Few candidates had techniques to solve this question. Some did write an answer, the most popular being 1 : 3 or 1*n* : 3*n*.	
		Total	**4**		
123		3	2	**M1** for 6 ÷ 2 oe **Examiner's Comments** This was usually correct, though a response of 12 minutes was common, as well as also 6 minutes.	
		Total	**2**		
124	a	285	2	M1 for $\frac{760}{(2+3+3)}$ soi 95 **Examiner's Comments** A number of candidates answered correctly using the appropriate method. A common error was to divide £760 by 3, but more unexpected means were also employed.	
	b	24	2	**M1** for $\frac{2}{3} \times 36$ oe **Examiner's Comments** It was rarely correct and many candidates used the same method as in (a), i.e. £36 ÷ 8, or 36 ÷ 2. Thus £18 was a common wrong answer.	Allow (0.66 or 0.7) × 36 for M1 only
		Total	**4**		
125		4 : 5	3		

					B1 for 25 or (45 – *their* 20) **M1** for *their* 20 : *their* 25 OR **M2** for $\frac{4}{9} : \frac{5}{9}$ seen or **M1** for $\frac{20}{45} : \frac{25}{45}$ oe seen If 0 scored, SC1 for answer 5 : 4	*Their* Yr 10 from (c) *Their* 25 is any value from 12 to 44 May be on answer line For M1 ratio must be seen and not implied from a "simplified" version 20 : 25 implies B1 M1 25 : 20 implies B1 oe 0.444[...] : (0.555 to 0.556) **Examiner's Comments** Some candidates wrote a ratio of 20 : 45 and scored zero marks.
		Total		**3**		
126	a		$195 < \$221 or £150 < £170 With correct working	**4**	Allow exchange rates of 1.25 to 1.35 leading to \$212.5[0] to \$229.5[0] or £144 to £156 **M2** for 195 ÷ 1.3 or 170 × 1.3 **A1** for [£]150 or [\$]221 or **M1** for a correct exchange rate e.g 26 ÷ 20 OR **M2** for building up to \$ equivalent of £170 or £ equivalent of \$195 e.g. 17 × 13 or 8.5 × 26 or 15 × 10 **A1** for [£]150 or [\$]221 or **M1** for building up to £170 or \$195 e.g. 17 × 10 or 8.5 × 20 or 15× 13 or 170 ÷ 10 = 17	Comparison in symbols or words required Allow FT *their* value from (b) Allow correctly rounded values used for **M** marks e.g for £7.69 or £8 for \$10 used

				OR **M2** for 195 ÷ 13 and 170 ÷ 10 **A1** for 15 and 17 or M1 for 195 ÷ 13 = 15 or 170 ÷ 10 = 17 If **0** scored **SC1** for $195 < ($212.5[0] to $229.5[0]) or (£144 to £156)< £170 **Examiner's Comments** Many candidates used a 'build up' method rather than calculating the exchange rate. Most of these did score some method marks, but not all arrived at the answer.	
	b	26 or **FT** their (c)	1 dep	**Dep** on **A1** or **SC1** awarded in part (c)	Accept 25.99
		Total	**5**		
127		319.44 cao	1	**B3** for 9319.44 soi or for 319[.4…] as final answer OR **M3** for (9000 × 1.007^5) – 9000 OR **M2** for 9000 × 1.007^5 oe implied by 9319[.44…] or 9000 × r^5 – 9000 oe OR **M1** for 9000 × 1.007^n oe implied by 9126[.44…] ($n \neq$	Answers of 315 and 9315 are from simple interest and score 0 For **M2** and **M1** where r = 1.7, 1.07 or 1.0007

					5 and $n \geq 2$) or $9000 \times r^n$ oe ($n \geq 2$)	
					Examiner's Comments	
					Candidates should be encouraged to use the compound interest formula rather than the 'year on year' method, as that often lead to the loss of the accuracy mark due to rounding off values for each year. Several candidates gave the value of the investment rather than the interest.	
			Total	**4**		
128			0.12 0.48	4	**B3** for 0.12 OR **M2** for $1 - (0.1 + 0.1 + 0.2)$ soi by 0.6 in working or two values in the table which sum to 0.6 or **M1** for $0.1 + 0.1 + 0.2$ soi by 0.4 in working **M1** for *their* $0.6 \div 5$ **Examiner's Comments** Many realised the values in the table needed to add to 1 and several were able to get to 0.6. Many of these were however unable to calculate the values using the given ratio.	Accept percentages or fractions
			Total	**4**		
129			Shows actual increase is 21 [%]with correct working	5	**M3** for $[k \times] 1.1 \times 1.1$ **oe** **A1** for answer 121[%] or for 1.21 OR **M1** for 1.1 **oe soi** **A1** for a correct evaluation of the	"Correct working" requires evidence of at least **M3** or alternate convincing approach Allow method marks if contained in correct method involving any invented starting

					first stage with *their* value If 0 scored **SC2** for answer 21[%] or **SC1** for 121% or 1.21 with no working	price e.g. **M3** for 100 × 1.1 × 1.1 **oe** e.g. for M1A1 uses 80 as value then gives 88 in working
					Examiner's Comments Almost all Foundation candidates found this question challenging. The few that were successful in gaining some marks worked with a starting 'wage' and this helped some gain the confidence to continue through the question. These candidates worked through the process of adding 10% and then finding 10% of the new wage and adding that also. If they chose their starting value well (e.g. £100) to give themselves simpler calculations, they were often able to go on to state the correct increase of 21%. It was rare to see use of the multiplier of 1.12. There was a high rate of no response.	
		Total	**5**			
130	a	150	2		**M1** for 18 ÷ 12 × 100 **oe** **Examiner's Comments** In this part many identified the correct method of 100 ÷ 12 × 18. Fewer looked to simplify this to an easier calculation of 100 ÷ 2 × 3, so errors or premature rounding occurred when attempting to divide 100 by 12.	
	b	Answer of 54	4		**M3** for 225 ÷ 50 × 12 **oe** or **B2** for 60 or 9 [eggs] **and** 225 or **M1** for 225 ÷ 50 or 10 ÷ 2 **soi**	For M3 allow a table with just one error

					Examiner's Comments The method often adopted in this part was to systematically work up in 50g amounts to 225g of butter. Many were able to reach 48 pancakes with ease, but then struggled to appreciate they could still half the quantity of pancakes enabling them to get to 54. Others used amounts for 2 eggs to reach 60 pancakes. Occasionally 225 ÷ 50 or 10 ÷ 2 was seen, but then there was unsuccessful progress beyond this.	
		Total	**6**			
131			40 nfww	4	**B2** for length of rectangle = 10 or **M1** for 4 ÷ 2 × 5 **M1** for 5 × 4 + 2 × *their* length **oe** **Examiner's Comments** Many found this difficult and few were able to use the ratio statement to calculate the length of the rectangle. A wide variety of possible rectangle lengths were suggested, some of these not connected to any of the values given. Many calculated the full perimeter of the rectangle and the pentagon and added these together, or included the internal common side. Some were confused between lengths and finding areas. A significant number did not attempt this question.	
		Total	**4**			
132			5000 [ml] or 0.45 [L] soi 9 × 450 **oe** Correct attempt to find 80% or 20% of 5000 **oe** 4050 and 4000 or 950 **and** 1000 **and** [They are] correct **oe**	B1 M1 M1 A2	or $\frac{9 \times 450}{5000}[\times 100]$ **oe** or $\frac{5000 - 9 \times 450}{5000}[\times 100]$ **oe** or 81% [and 80%] or 19% [and 20%] If A0 scored **B1** for 4050 or 4000 or 950 or 1000	Correct conversion at any stage Alternate approaches are possible M1 may be implied by 4000 or 1000 or 81% or 19% seen For A2 accept in other correct consistent units for

						comparison eg 4.05[L] and 4[L] and must have no incorrect statement For B1 accept eg 4.05[L] or 4[L]
						Examiner's Comments Candidates who were organised generally scored 3 or 4 marks. There were a few errors in converting between ml and litres and candidates incorrectly converting 5 litres to 500 ml often struggled, as this implied that after one week more than 80% had been used up. Most attempted 450 × 9, although some grid methods had errors, especially when a column or row was used for 0 yet multiplication by 0 was performed the same as multiplication by 1. Many used repeat addition and errors occurred where the 450s didn't line up and carried figures were lost or added to the wrong units. Those doing 10 × 450 and then subtracting 450 were much more likely to get to the correct 4050. Finding a comparison figure to 4050 proved more difficult. Many assumed 4050 was 80% and so the mechanic was correct. In these cases, no attempt to specify the 80% of 5000 or 5 litres was made. Instead of comparing their 4050 and 80% of 5000, a number of candidates worked out 450 as a percentage of 500. In general, many candidates showed they understood the requirement, however candidates struggled if they weren't confident in converting from ml to litres and vice versa, or weren't able to be precise in deciding whether an amount is 'over 80%'.
			Total	**5**		
133			3 : 8	2	**M1** for correct partial simplification of 75 : 200	Eg 15 : 40 but not eg 37.5 : 100 $1 : 2\frac{2}{3}$ scores M1 **Examiner's Comments**

| | | | | | Simplification of the given ratio in this part often started with dividing both parts by two. As this led to a decimal for one part, it was rare for the correct answer to be achieved. Those that started dividing both parts by 5 had mixed success. Some gained a method mark for reaching 15 : 40, but others struggled with the division, resulting in errors such as 15 : 20. |
| | | **Total** | | **2** | |