Functional Skills Certificate
Functional Mathematics

Level 2

Mark scheme

4368

June 2018

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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Glossary for Mark Schemes

Examinations are marked to award positive achievement.

Marks are awarded for demonstrating the following interrelated **process skills**.

Representing Selecting the mathematics and information to model a situation.

R.1	Candidates recognise that a situation has aspects that can be represented using mathematics.
R.2	Candidates make an initial model of a situation using suitable forms of representation.
R.3	Candidates decide on the methods, operations and tools, including ICT, to use in a situation.
R.4	Candidates select the mathematical information to use.

Analysing Processing and using mathematics.

A.1	Candidates use appropriate mathematical procedures.
A.2	Candidates examine patterns and relationships.
A.3	Candidates change values and assumptions or adjust relationships to see the effects on answers in models.
A.4	Candidates find results and solutions.

Interpreting Interpreting and communicating the results of the analysis.

I.1	Candidates interpret results and solutions.
I.2	Candidates draw conclusions in light of situations.
I.3	Candidates consider the appropriateness and accuracy of results and conclusions.
I.4	Candidates choose appropriate language and forms of presentation to communicate results and solutions.

In particular, individual marks are mapped onto the following **skills standards**.

Representing Making sense of the situations and representing them.
A learner can:

- **Ra** Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.
- **Rb** Identify the situation or problems and identify the mathematical methods needed to solve them.
- **Rc** Choose from a range of mathematics to find solutions.

Analysing Processing and using the mathematics.
A learner can:

- **Aa** Apply a range of mathematics to find solutions.
- **Ab** Use appropriate checking procedures and evaluate their effectiveness at each stage.

Interpreting Interpreting and communicating the results of the analysis.
A learner can:

- **Ia** Interpret and communicate solutions to multistage practical problems in familiar and unfamiliar contexts and situations.
- **Ib** Draw conclusions and provide mathematical justifications.

To facilitate marking, the following categories are used:

- **M** Method marks are awarded for a correct method which could lead to a correct answer.
- **A** Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
- **B** Marks awarded independent of method.
- **ft** Follow through marks. Marks awarded following a mistake in an earlier step.
- **SC** Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
- **oe** Or equivalent. Accept answers that are equivalent.
  eg, accept 0.5 as well as $\frac{1}{2}$

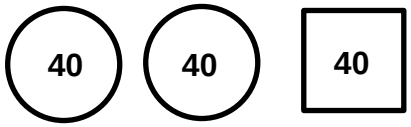
Question	Answer	Mark	Comments
1 (a)	$\frac{1.74 \times 36}{2.4}$ or 62.64 ÷ 2.4 or 1.74 × 15 or 0.725 × 36	M1 *Ra*	
	26.1	A1 *Aa*	
Check	Reverse calculation their 26.1 × 2.4 ÷ 36 = 1.74 or their 26.1 × 2.4 ÷ 1.74 = 36 or 1.74 × 36 ÷ their 26.1 = 2.4 Estimation 2 × 40 ÷ 2 = 40 or 1.7 × 40 ÷ 2 = 34	B1ft *Ab*	
1 (a)	**Additional Guidance**		
	Using values from Data Sheet Correct use of one value → M1A0 1.56 × 36 ÷ 2.4 or 23.4 or 1.74 × 24 ÷ 2.4 or 17.4 or 1.74 × 36 ÷ 1.8 or 34.8 Use of more than one value → M0A0	**Check** Reverse method must be exact reverse of their method. E.g. For 1.74 × 36 ÷ 2.4 must see any exact reverse of this For 62.64 ÷ 2.4 = 26.1 → 26.1 × 2.4 = 62.64 **Holistic marking** Mark 1(a) and 1(a) check holistically	

Question	Answer	Mark	Comments
1 (b)	24 × 18 + 16 × 10 = 592 or 16 × 28 + 8 × 18 = 592 or 28 × 24 – 10 × 8 = 592 or 16 × 10 + 8 × 18 + 16 × 18 = 592	B2 *Ia* *Ib*	B1 24 × 18 or 432 or 16 × 10 or 160 or 16 × 28 or 448 or 8 × 18 or 144 or 28 × 24 or 672 or 10 × 8 or 80 or 16 × 18 or 288
	Additional Guidance		
	Award of B2 Must see full and fully correct calculation with answer of 592 to score B2 E.g. 432 + 160 scores B1 only 24 × 18 + 16 × 10 scores B1 only **Award of B1** Award B1 if fully correct calculation is followed by incorrect answer. Award if seen with any dimensionally valid but inappropriate calculation. Treat as choice and do **not** award if seen with other calculations that are dimensionally invalid Examples of dimensionally invalid calculations 16 × 10 × 18 × 8 × 18 etc 28 × 10 16 + 10 + 18 + 8 + 18 etc 24 × 8		

Question	Answer	Mark	Comments
1 (c)	592 ÷ 4.8 or 123.3(…) or 123	M1 *Aa*	
	592 – their 123 × 4.8 or 1.6	M1 *Ia*	their 123 can be any integer < 124
	their 1.6 ÷ 0.3 or 5.3(…) or 6	M1 *Aa*	their 1.6 must come from an integer value of their 123 < 124 their 1.6 must give their 6 > 0
	their 123 × 52.5 or 6457.5 or their 6 × 3.82 or 22.92	M1 *Ia*	their 123 must be their 123.3(…) rounded down or their 6 must be their 5.3(…) rounded up 6457.5 implies M2 22.92 implies M3
	their 123 × 52.5 + their 6 × 3.82 or their 6457.5 + their 22.92 or 6480.42	M1 *Rc*	their 6457.5 and their 22.92 can be from values of their 124 and their 6 that have not been rounded or that have not been rounded correctly
	123 (large bags, L) seen and 6 (small bags, S) seen and 6480.42	A1 *Aa*	SC1 124 L SC2 6510 SC2 any combination of L and S that covers an area within the range [592, 592.3) e.g. 100 L, 374 S SC3 123 L and 6 S with no cost SC4 any combination of L and S that covers an area within the range [592, 592.3) and correct total cost for their bags e.g. 100 L, 374 S and 6678.68

<table>
<tr><td rowspan="4">1 (c)</td><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="3">No rounding → M1M0M0M0M1A0 max
No costs → M1M1M1M0M0A0 max
Large bag only → M1M0M0M1M0A0 max
Small bag only → M0M0M0M1M0A0 max
592 ÷ 4.8 and 592 ÷ 0.3 → M1M0M0M1M1A0 max
Incorrect large bags then correct on ft → M1M1M1M1M1A0 max</td></tr>
<tr><td>Example 1
592 ÷ 4.8 = 123.3 → 120 L M1
592 – 120 × 4.8 = 16 M1
16 ÷ 0.3 = 54 M1
120 × 52.5 = 6300
54 × 3.82 = 206.28 M1
6300 + 206.28 = 6506.28 M1
120 L, 54 S and £6506.28 A0</td><td colspan="2">Example 2
120 L M0
592 – 120 × 4.8 = 16 M1
16 ÷ 0.3 = 54 M1
120 × 52.5 = 6300
54 × 3.82 = 206.28 M1
6300 + 206.28 = 6506.28 M1
120 L, 54 S and £6506.28 A0</td></tr>
<tr><td>Example 3
592 ÷ 4.8 = 123.3
592 ÷ 0.3 = 1973.3
123.3 × 52.5 = 6473.25
1973.3 × 3.82 = 7538
6473.25 + 7538 = 14 011
Scores M1M0M0M0M1A0</td><td>Example 4
592 ÷ 4.8 = 123.3
592 ÷ 0.3 = 1973.3
123.3 × 52.5 = 6473.25
1973.3 × 3.82 = 7538
Cheaper with L
Scores M1M0M0M0M0A0</td><td>Example 5
592 ÷ 4.8 = 123.3
592 ÷ 0.3 = 1973.3
123 × 52.5 = 6457.5
1974 × 3.82 = 7540.68
6457.5 + 7540.68 = 13 998.18
Scores M1M0M0M1M1A0</td></tr>
</table>

Question	Answer	Mark	Comments
1 (d)	any three correct from exactly 3 squares with side 1 cm (rockers) exactly 1 square with side 2.5 cm (climbing frame) exactly 2 rectangles 4 cm by 2 cm (swing sets) exactly 1 rectangle 1 cm by 2 cm (sandpit)	B2 *Ra* *Aa*	B1 any one correct or any three with same incorrect scale
	1 circle of radius 1.5 cm	B1 *Rc*	allow freehand attempt
	any two in correct positions from 1 or 2 swing sets in part nearer N end exactly 3 rockers in part nearer S end sand pit in SW corner	B1 *Aa*	do not have to be correct shape or size can be implied by labelling or by sizes in proportion
	all 8 items labelled with at least 7 the correct size	B1ft *Ia*	
	Additional Guidance		
	Condone freehand shapes if intention is clear Correct label on one rocker can imply labels on the other two rockers Correct label on one swing set can imply label on the other swing set A rocker can be implied by label in the centre of a square on the grid with square not drawn Allow tolerance of ±2 mm Nearer N end means the majority of a shape is above the 7th grid line up. Nearer S end means the majority of a shape is below the 7th grid line up. In SW corner means the majority of the shape is below the 7th grid line up and to the left of 6th grid line from the left Maximum mark with one error is B4		

Question	Answer	Mark	Comments
2 (a)	**Alternative method 1**		
	120 ÷ (2 + 1) × 2 = 80	B2 *Ia* *Ib*	B1 2 + 1 or 3
	Alternative method 2		
	80 ÷ 2 = 40 or 40 × 2 = 80 and 80 + 40 = 120 or 120 – 80 = 40	B2 *Ia* *Ib*	B1 80 ÷ 2 = 40 or 40 × 2 = 80 or 80 + 40 = 120 or 120 – 80 = 40
	Alternative method 3		
	120 – 80 = 40 and 80 ÷ 40 : 40 ÷ 40 = 2 : 1	B2 *Ia* *Ib*	B1 120 – 80 = 40 or 80 ÷ 40 : 40 ÷ 40 = 2 : 1
	Additional Guidance		
	Examples 120 ÷ 3 = 40 and 80 ÷ 2 = 40 120 – 80 = 40 and 120 ÷ 3 = 40 40 + 40 = 80 and 80 + 40 =120 120 ÷ 3 = 40 and 40 + 80 = 120 80 : 40 → 40 : 20 → 2 : 1 80 : 40 → 2 : 1 80 : 40 → 40 : 20 → 4 : 2 → 2 : 1 and 80 + 40 = 120 2 : 1 → 10 : 5 → 40 : 20 → 80 : 40 and 80 + 40 = 120 120 – 80 = 40 and 40 is ½ of 80	 B2 B2 B2 B2 B1 bod B0 B2 bod B2 B2 bod	The ratio 2 : 1 can be implied by diagrams E.g.  By itself this diagram is worth B1 Needs 40 and 80 linked to 120 for B2

Question	Answer	Mark	Comments
2 (b)	**Alternative method 1**		
	300 × their 80 ÷ 1000 × $\frac{3}{4}$ or 18	M3 *Ra* *Rb* *Aa*	ft their 80 from 2(a) M3 is implied by 57.6 M2 any 3 values combined with correct operations M1 any 2 values combined with correct operation
	300 × (120 – their 80) or 300 × their 80 ÷ 2 or 300 × their 40 or 12 000 or 12	M1 *Ra*	implied by 18.72
	their 12 000 ÷ 250 or 48 or (1000 ÷ 250) × 0.39 or 1.56	M1 *Aa*	implied by 18.72
	their 18 × 3.20 + their 48 × 0.39 or their 18 × 3.20 + their 12 × their 1.56 or their 57.6 + their 18.72	M1 *Aa*	their 48, their 18 and their 12 must be > 1
	76.32 and No	A2 *Ia* *Ib*	A1 76.32 or A1ft correct decision for their value must score 3 of the first 5 method marks and the sixth method mark

	Additional Guidance
2 (b) **Alt 1**	The first 4 marks are for calculating the amounts of nuts and lard. **Alt method 1** This method uses the information given in 2(a) Marks are awarded for these steps calculating the total weight of bird seed calculating the weight of nuts calculating the weight of lard converting g → kg The steps can be done in various orders. **Follow through** ft their values of 18 and 12 to the next two method marks **First M2 combinations** 300 × their 80 × $\frac{3}{4}$ = 18 000 300 × their 80 ÷ 1000 = 24 300 × $\frac{3}{4}$ ÷ 1000 = 0.225 their 80 × $\frac{3}{4}$ ÷ 1000 = 0.06 **First M1 combinations** 300 × their 80 = 24 000 300 × $\frac{3}{4}$ = 225 300 ÷ 1000 = 0.3 their 80 × $\frac{3}{4}$ = 60 their 80 ÷ 1000 = 0.08 $\frac{3}{4}$ ÷ 1000 = 0.00075 **Incorrect conversion used but not shown** Award **M2** for digits 18 seen Award **M1** for digits 24 seen or digits 225 seen or digit 6 seen

Question	Answer	Mark	Comments
2 (b)	**Alternative method 2**		
	300 × (120 ÷ 3 × 2) ÷ 1000 × $\frac{3}{4}$ or 18	M3 *Ra* *Rb* *Aa*	M3 is implied by 57.6 M2 any 3 of 300, 120 ÷ 3 × 2, 1000 or $\frac{3}{4}$ combined with correct operations M1 any 2 of 300, 120 ÷ 3 × 2, 1000 or $\frac{3}{4}$ combined with correct operation
	300 × (120 ÷ 3 × 1) or 300 × 40 or 12 000 or 12	M1 *Ra*	implied by 18.72
	their 12 000 ÷ 250 or 48 or (1000 ÷ 250) × 0.39 or 1.56	M1 *Aa*	Implied by 18.72
	their 18 × 3.20 + their 48 × 0.39 or their 18 × 3.20 + their 12 × their 1.56 or their 57.6 + their 18.72	M1 *Aa*	their 48, their 18 and their 12 must be > 1
	76.32 and No	A2 *Ia* *Ib*	A1 76.32 or A1ft correct decision for their value must score 3 of the first 5 method marks and the sixth method mark

	Additional Guidance
2 (b) **Alt 2**	The first 4 marks are for calculating the amounts of nuts and lard. **Alt method 2** This method starts again ignoring the information given in 2(a) Marks are awarded for these steps calculating the total weight of fat cakes using the ratio correctly calculating the weight of nuts converting g → kg The steps can be done in a variety of orders. **Follow through** ft their values of 18 and 12 to the next two method marks **First M2 combinations** $300 \times (120 \div 3 \times 2) \times \frac{3}{4} = 18\,000$ $\quad$ $300 \times (120 \div 3 \times 2) \div 1000 = 24$ $300 \times \frac{3}{4} \div 1000 = 0.225$ $\quad$ $80 \times \frac{3}{4} \div 1000 = 0.06$ **First M1 combinations** $300 \times (120 \div 3 \times 2) = 24\,000$ $\quad$ $300 \times \frac{3}{4} = 225$ $\quad$ $300 \div 1000 = 0.3$ $(120 \div 3 \times 2) \times \frac{3}{4} = 60$ $\quad$ $(120 \div 3 \times 2) \div 1000 = 0.08$ $\quad$ $\frac{3}{4} \div 1000 = 0.00075$ **Incorrect conversion used but not shown** Award **M2** for digits 18 seen Award **M1** for digits 24 seen or digits 225 seen or digit 6 seen

Question	Answer	Mark	Comments
2 (b)	**Alternative method 3**		
	300 × 120 ÷ 1000 × $\frac{3}{4}$ or 27	M2 *Ra* *Rb* *Aa*	M2 is implied by 86.4 M1 any 2 of 300, 120, 1000 or $\frac{3}{4}$ combined with correct operation
	300 × 120 ÷ 1000 – their 27 or 36 000 ÷ 1000 – their 27 or 36 000 – their 27 × 1000 or 9000 or 36 – their 27 or 9	M1 *Ra*	implied by 14.04
	their 9 000 ÷ 250 or 36 or (1000 ÷ 250) × 0.39 or 1.56	M1 *Aa*	implied by 14.04
	their 27 × 3.20 + their 36 × 0.39 or their 27 × 3.20 + their 9 × their 1.56 or their 86.4 + their 14.04 or 100.44	M1 *Aa*	their 36, their 27 and their 9 must be > 1
	100.44 and no	A1ft *Ia*	

	Additional Guidance
2 (b) **Alt 3**	The first 4 marks are for calculating the amounts of nuts and lard. **Alt method 3** Here the candidate starts again but ignores the ratio completely. Can only score 2 of the first 3 marks. Marks are awarded for calculating the total weight of fat cakes calculating the weight of nuts converting g → kg The steps can be done in a variety of orders. **Follow through** ft their values of 18 and 12 to the next two method marks A1ft can be awarded if overall 4 method marks are scored and a total cost from both nuts and lard has been obtained. **First M1 combinations** $300 \times 120 = 36\,000$ $300 \times \frac{3}{4} = 225$ $300 \div 1000 = 0.3$ $(120 \times \frac{3}{4} = 90$ $120 \div 1000 = 0.12$ $\frac{3}{4} \div 1000 = 0.00075$ **Incorrect conversion used but not shown** Award **M1** for digits 27 seen

Question	Answer	Mark	Comments
2 (c)	3 × 2 (+) 14 × 3 (+) 27 × 4 (+) 46 × 5 (+) 10 × 6 or 6 (+) 42 (+) 108 (+) 230 (+) 60 or 446	M1 *Ra*	allow one error or omission
	their 446 ÷ 100	M1 *Rc*	may be implied by 4.5 or 4.46
	4.46	A1 *Aa*	may be implied by 4.5
	4.5	B1ft *Aa*	their 4.46 rounded to 1 decimal place (their 4.46 must be to 2 or more decimal places)
	Additional Guidance		
	check for working next to table **their 4.46 not shown** 4.5 only implies 4.46 (and M2A1B1) if there is no conflicting evidence e.g. 5 + 42 + 108 + 230 + 60 = 445 445 ÷ 100 leading directly to 4.5 scores M2A0B1ft In all other situations must see their mean to at least 2 dp to award B1ft for a correctly rounded follow through e.g. 2 + 3 + 4 + 5 + 6 = 20 followed by 20 ÷ 6 Must see 3.33 … rounded to 3.3 to award M0A0B1ft		

Question	Answer	Mark	Comments
3 (a)	**Alternative method 1** (per year)		
	38 × 12 or 456	M1 *Ra*	
	0.03 × their 456 or 13.68 or 0.02 × 372 or 7.44	M1 *Rb*	
	0.03 × their 456 or 13.68 and 0.02 × 372 or 7.44	M1 *Rc*	implied by 21.12 must be cashback per year
	their 13.68 + their 7.44 + 110 – 60	their 13.68 + their 7.44 + 110 and 70 + 60	M1 *Aa*	must be from cashback per year
	71.12 and yes	131.12 and 130 and yes	A2 *Ib* *Ia*	A1 71.12 or 131.12 and 130 or A1ft correct decision from their value(s) must score M1M1M0M1
	Additional Guidance		
	Not dealing with years and months but % calculations correct Use **Alt 3**; can score M1M1M0M0A0 max **Dealing with years and months correctly but one % calculation incorrect** Can score M1M1M0M1A1ft max **Dealing with years and months correctly but both % calculations incorrect** Can score M1M0M0M1A0 their 13.68 must be from their attempt to find 3% of their 456 their 7.44 must be from their attempt to find 2% of 372		

Question	Answer	Mark	Comments
3 (a)	**Alternative method 2** (per month)		
	372 ÷ 12 or 31	M1 *Ra*	
	0.03 × 38 or 1.14 or 0.02 × their 31 or 0.62	M1 *Rb*	
	0.03 × 38 or 1.14 and 0.02 × their 31 or 0.62	M1 *Rc*	implied by 1.76 or 21.12 must be cashback per month
	(their 1.14 + their 0.62) × 12 + 110 – 60 / (their 1.14 + their 0.62) × 12 + 110 and 70 + 60	M1 *Aa*	must be from cashback per year
	71.12 and Yes / 131.12 and 130 and yes	A2 *Ib* *Ia*	A1 71.12 or 131.12 and 130 or A1ft correct decision from their value(s) must score M1M1M0M1
	Additional Guidance		
	Not dealing with years and months but % calculations correct use **Alt 3**; can score M1M1M0M0A0 max **Dealing with years and months correctly but one % calculation incorrect** can score M1M1M0M1A1ft max **Dealing with years and months correctly but both % calculations incorrect** can score M1M0M0M1A0 their 1.14 must be from their attempt to find 3% of 38 their 0.62 must be from their attempt to find 2% of their 31		

Question	Answer	Mark	Comments
3 (a)	**Alternative method 3**		
	0.03 × 38 or 1.14	M1 *Ra*	
	0.02 × 372 or 7.44	M1 *Rb*	
	their 7.44 and 12 × their 1.14 or their 7.44 and their 13.68 or 21.12	M1 *Rc*	
	their 21.12 + 110 – 60 / their 21.12 + 110 and 70 + 60	M1 *Aa*	must be cashback per year
	71.12 and yes / 131.12 and 130 and yes	A2 *Ib* *Ia*	A1 71.12 or 131.12 and 130 or A1ft correct decision from their value(s) must score M1M0M1M1 or M0M1M1M1
	Additional Guidance		
	Not dealing with years and months but % calculations correct use **Alt 3**; can score M1M1M0M0A0 max **Dealing with years and months correctly but one % calculation incorrect** can score M1M0M1M1A1ft max or M0M1M1M1A1ft **Dealing with years and months correctly but both % calculations incorrect** can score M0M0M1M1A0 max their 1.14 must be from their attempt to find 3% of 38 their 7.44 must be from their attempt to find 2% of their 372		

Question	Answer	Mark	Comments
3 (b)	£180	B1 *Aa*	

Question	Answer	Mark	Comments
3 (c)	**Alternative method 1**		
	3200 (+) 900 ÷ 2 or 3200 (+) 450 or 3650	M1 *Ra*	points from spending
	(3200 + 900) ÷ 4 or 4100 ÷ 4 or 3200 ÷ 4 (+) 900 ÷ 4 or 800 (+) 225 or 1025	M1 *Rb*	credit card points 4675 implies M2
	2600 ÷ 8 or 325	M1 *Aa*	credit card points from other shops
	their 3650 + their 1025 + their 325 = their 5000 or their 3200 + their 450 + their 800 + their 225 + their 325 = their 5000	M1 *Rc*	
	3650 + 1025 + 325 = 5000 or 3200 + 450 + 800 + 225 + 325 = 5000	A1 *Ia*	

Question	Answer	Mark	Comments
3 (c)	**Alternative method 2**		
	3200 (+) 3200 ÷ 4 or 3200 (+) 800 or 4000	M1 *Ra*	grocery points (spending + credit card)
	900 ÷ 2 (+) 900 ÷ 4 or 450 (+) 225 or 675	M1 *Rb*	petrol points (spending + credit card) 4675 implies M2
	2600 ÷ 8 or 325	M1 *Aa*	credit card points from other shops
	their 4000 + their 675 + their 325 = their 5000 or their 3200 + their 800 + their 450 + their 225 + their 325 = their 5000	M1 *Rc*	
	4000 + 675 + 325 = 5000 or 3200 + 800 + 450 + 225 + 325 = 5000	A1 *Ia*	

<table>
<tr><td rowspan="3">3 (c)</td><td colspan="4">Additional Guidance</td></tr>
<tr><td colspan="4">Common error
3200 + 900 ÷ 4 = 3425 instead of (3200 + 900) ÷ 4 = 1025
900 + 3200 ÷ 4 = 1700 instead of (3200 + 900) ÷ 4 = 1025
Award M1 for expression without brackets or incorrect brackets or 3425 seen or 1700 seen
Examples</td></tr>
<tr><td>3200 + 900 ÷ 2 = 3650
(3200 + 900) ÷ 8 = 512.5
2600 ÷ 4 = 650
3650 + 512.5 + 650 = 4812.5</td><td>M1
M0
M0
M1A0</td><td>3200 + 900 ÷ 2 = 3650
3650 ÷ 4 = 912.5
2600 ÷ 8 = 325
3650 + 912.5 + 325 = 4887.5</td><td>M1
M0
M1
M1A0</td></tr>
</table>

Question	Answer	Mark	Comments
3 (d)	**Alternative method 1**		
	3200 × 4 or 12 800 or 3200 × 0.04 or 128	M1 *Ra*	3200 can be 3225 or 3175 must be consistent units
	165 – (3200 × 4) ÷ 100 (+ 25) or 165 – (3200 × 0.04) (+ 25) or 37 (+25)	M1 *Rc*	
	62	A1 *Aa*	SC1 137 SC2 61 or 63
	Alternative method 2		
	165 ÷ 0.04 (– 3200) or 16500 ÷ 4 (– 3200) or 4125 (– 3200) or 925	M1 *Ra*	3200 can be 3225 or 3175 must be consistent units
	(165 ÷ 0.04 – 3200) × 0.04 (+ 25) or (16500 ÷ 4 – 3200) × 0.04 (+ 25) or 925 × 0.04 (+25) or 37 (+25)	M1 *Rc*	
	62	A1 *Aa*	SC1 137 SC2 61 or 63

	Additional Guidance
	Many are confusing £ with points and giving the incorrect 165 × 4 or 165 × 0.04 **First M1** If their 3200 is 3225 their 128 → 129 If their 3200 is 3175 their 128 → 127 **Second M1** If their 3200 is 3225 37 → 38 If their 3200 is 3175 37 → 36

Question	Answer	Mark	Comments
4 (a)	**Alternative method 1**		
	2 × 240 (+) 2 × 110 or 480 (+) 220 or 700	M1 *Ra*	
	their 700 × 0.2 or 140 or their 480 × 0.2 (+) their 220 × 0.2 or their 96 (+) their 44 or 140	M1 *Rc*	M2 their 700 × 1.2
	their 700 + their 140 or 840 or their 480 + their 96 + their 220 + their 44 or their 576 + their 264 or 840	M1 *Aa*	
	their 840 – 719 or 719 + 120 their 840 – 120	M1 *Aa*	
	121 and yes or 840 and 839 and yes or 720 and yes	A2 *Ia* *Ib*	A1 121 or 840 and 839 or 720 or A1ft correct decision from their value(s) must score 2 of the first 3 method marks and the fourth method mark

	Additional Guidance
4(a) **Alt 1**	**incorrect % calculation can score** M1M0M1M1A1ft max → to score third M1 must see their method for finding % **% calculation ignored** M1M0M0M0A0 max

Question	Answer		Mark	Comments
4 (a)	**Alternative method 2**			
	240 × 0.2 or 48 or 110 × 0.2 or 22	240 × 2 or 480 or 110 × 2 or 220	M1 *Ra*	M3 2 × 240 × 1.2 (+) 2 × 110 × 1.2 M2 240 × 1.2 (+) 110 × 1.2 or 420
	240 + their 48 or 288 or 110 + their 22 or 132 or 420	their 480 × 0.2 or 96 or their 220 × 0.2 or 44 or 140	M1 *Rc*	
	2 × their 288 + 2 × their 132 or their 576 + their 264 or 840	their 480 + 96 + their 220 + 44 or their 480 + their 220 + their 140	M1 *Aa*	
	their 840 – 719 or 719 + 120	their 840 – 120	M1 *Aa*	
	121 and yes or 840 and 839 and yes or 720 and yes		A2 *Ia* *Ib*	A1 121 or 840 and 839 or 720 or A1ft correct decision from their value(s) must score 2 of the first 3 method marks and the fourth method mark

	Additional Guidance
4(a) **Alt 2**	**incorrect % calculation can score** M0M1M1M1A1ft max → to score second M1 must see their method for finding % **% calculation ignored** M0M0M1M0A0 max

Question	Answer	Mark	Comments
4 (a)	**Alternative method 3**		
	(240 + 110) × 0.2 or 240 × 0.2 (+) 110 × 0.2 or 350 × 0.2 or 70	M1 *Ra*	
	their 350 + their 70 or 420	M1 *Rc*	M2 their 350 × 1.2
	their 420 × 2 or 840	M1 *Aa*	
	their 840 – 719 or 719 + 120 / their 840 – 120	M1 *Aa*	
	121 and yes or 840 and 839 and yes or 720 and yes	A2 *Ia* *Ib*	A1 121 or 840 and 839 or 720 or A1ft correct decision from their value(s) must score 2 of the first 3 method marks and the fourth method mark

	Additional Guidance
4(a) **Alt 3**	**incorrect % calculation can score** M0M1M1M1A1ft max → to score second M1 must see their method for finding % **% calculation ignored** M0M0M1M0A0 max

Question	Answer		Mark	Comments
4 (b)	688 ÷ 60 × 7.5 or [11.46, 11.5] × 7.5 or 5160 ÷ 60	60 ÷ 7.5 or 8 and 688 ÷ their 8 or 7.5 ÷ 60 or 0.125 and 688 × their 0.125	M1 *Ra*	
	86		A1 *Aa*	
Check	reverse calculation e.g. 86 ÷ 7.5 × 60 = 688 or alternative method e.g. 688 ÷ 8 = 86 or 7.5 ÷ 60 = 0.125 and 0.125 × 688 = 86 or estimation, e.g. 700 ÷ 60 × 8 = 93 or 700 ÷ 60 × 10 = 116. 6 …		B1ft Ab	
4(b)	**Additional Guidance**			
	Rounding error 688 ÷ 60 = 11.46, 11.47, 11.4 or 11.5 and their 11.46 × 7.5 award M1A0 if this does **not** lead to 86		**Decimal time** Use of 7.3 (from 7 min 30 sec) instead of 7.5 can score M1A0 **Holistic marking** Mark 4(b) and 4(b) check holistically	

Question	Answer	Mark	Comments
4 (c)	fully correct rota meeting all four conditions Amy works on 5 days Amy does not work on Sunday Kim, Sal and Tom each work 4 days no-one works for more than 3 days in a row	B3 *Ia* *Ia* *Ia*	B2 three conditions met B1 two conditions met
	Additional Guidance		
	Mark the second grid unless blank Ignore entries in the "blacked-out" slots If any person is in 2 or 3 slots on the same day can score B2 max If 1 or 2 slots are left blank can score B2 max If more than 2 slots are left blank can score B1 max If any of Sunday is blank the criteria "Amy does not work on Sunday" **cannot** be met The criteria "no-one works for more than 3 days in a row" can only be met with no blanks **Examples**		

A K A T A S K T A K S A S T K S T scores B3	A K A T A S K T A K S K S T A S T scores B2	A S A S A K T A K S K S T A T T scores B1

Question	Answer	Mark	Comments
4 (d)	25 × 9 × 2 or 450	M1 *Ra*	
	their 450 × 1000 × 0.0004	M1 *Rb*	
	180	A1 *Aa*	SC2 18 or 1800
	Additional Guidance		
	Second M1 their 450 can be anything calculated from 25, 9 and 2 e.g. 25 × 9 or 225 **Misread** For 0.0004 allow 0.004 seen or 0.00004 seen for M2A0 max		