FUNCTIONAL SKILLS CERTIFICATE
FUNCTIONAL MATHEMATICS
4367
Level 1

Mark scheme
November 2018

Version: 1.0 Final

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.

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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)	**Alternative method 1**		
	7 × 3 or 21 or 5 × 4 or 20 or 3 × 6 or 18	M1 *Rb*	
	7 × 3 + 5 × 4 + 3 × 6 or 21 + 20 + 18	M1 *Rc*	
	59	A1 *Aa*	
	Alternative method 2		
	7 × 12 + 5 × 16 + 3 × 24 or 84 + 80 + 72 or 236	M1 *Rc*	
	their 236 ÷ 4 or their 236 × $\frac{1}{4}$	M1 *Rb*	their 236 can be 52
	59	A1 *Aa*	
	Additional Guidance		

Question	Answer	Mark	Comments
1(b)	21 00 on March 13th	B1 *Aa*	
	Additional Guidance		

1(c)	**Alternative method 1**		
	148 ÷ 10 or 14.8 or 90 ÷ 6 or 15	M1 *Rc*	
	14.8 and 15 and Yes	A2 *I,I*	A1 for 14.8 and 15 or A1ft correct decision for their values if both values come from attempt at mean
	Alternative method 2		
	90 ÷ 6 × 10 or 148 ÷ 10 × 6	M1 *Rc*	
	150 and Yes or 88.8 and Yes	A2 *I,I*	A1 for 150 or 88.8 or A1ft correct decision for their value
	Additional Guidance		
	Allow Laura's is heavier/the greater weight etc for Yes		
	Ignore any attempt to convert to kg after 14.8 and/or 15 seen		
	working in kg throughout can gain full marks [67.2, 67.3] ÷ 10 or 6.7…. or [40.9, 41] ÷ 6 or 6.8……		
	Dividing both weights by 10 or by 6 can score up to 2 marks eg 148 ÷ 10 = 14.8 90 ÷ 10 = 9 No		M1A0A1ft

Question	Answer	Mark	Comments
1(d)	**Alternative method 1**		
	17 × 5 or 85	M1 *Ra*	
	their 85 ÷ 11	M1 *Aa*	their 85 cannot be 8.2 17 ÷ 11 × 5 scores M2
	7.7(..) and Australia	A2 *I,I*	A1 7.7(..) or A1 ft correct decision for their value with at least one method mark scored
	Alternative method 2		
	8.2 × 11 or 90.2	M1 *Ra*	
	their 90.2 ÷ 5	M1 *Aa*	their 90.2 cannot be 17 8.2 ÷ 5 ×11 scores M2
	18.04 and Australia	A2 *I,*	A1 18.04 or A1ft correct decision for their value with at least one method mark scored
	Additional Guidance		
	For the decision allow anything that indicates the fish caught in Australia eg the one last year, the 8.2kg one		

Question	Answer	Mark	Comments
1(e)	(1st) Steve (2nd) Ben (3rd) Amy	B3 *Rb,I,I*	B2 for Steve Ben and Amy in the wrong order or Steve (1st), Ben (2nd) and another person other than Amy(3rd) or Steve and Ben joint 1st, Amy 2nd and Fred 3rd B1 for Steve first (only Steve) or any two of Steve, Ben and Amy selected with another person or no 3rd person or Steve and Ben joint 1st, Amy 2nd and another 3rd (not Fred) or no-one 3rd
	Additional Guidance		

Question	Answer	Mark	Comments
2(a)	**Alternative method 1**		
	3 × 60 or 180 or 60 × 10 or 600	M1 *Aa*	3 × 60 ×10 in any order scores M2
	their 180 × 10 or their 600 × 3 or 1800	M1 *Ra*	
	1800 and 1809 and No or 1800 and its (£)9 short	A2 *I,I*	A1 1800 and 1809 or A1ft correct conclusion for their values if both method marks scored and their 1809 is a council tax value from the table
	Alternative method 2		
	3 × 60 or 180	M1 *Aa*	
	1809 ÷ their 180 or 10.05 or 1809 ÷ 10 or 180.9(0)	M1 *Ra*	condone any council tax value from the table for 1809
	10.05 and No or 180 and 180.9(0) and No	A2 *I,I*	A1 10.05 or 180 and 180.9(0) or A1 ft correct conclusion for their value(s) if both method marks scored

2(a) cont'd	**Alternative method 3**		
	1809 ÷ 3 or 603 or 1809 ÷ 10 or 180.9(0)	M1 *Ra*	condone any council tax value from the table for 1809
	their 603 ÷ 10 or their 180.9(0) ÷ 3	M1 *Aa*	their 603 must be from use of a council tax value from the table
	60.3(0) and No	A2 *I,I*	A1 60.3(0) or A1 ft correct conclusion for their value(s) if both method marks scored
	Alternative method 4		
	1809 ÷ 3 or 603	M1 *Ra*	
	60 × 10 or 600	M1 *Aa*	
	603 and 600 and No	A2 *I,I*	A1 603 and 600 or A1ft correct conclusion for their value(s) if both method marks scored
	Alternative method 5		
	1809 ÷ 60 or 30.15	M1 *Ra*	number of payments required
	their 30.15 ÷ 3 or 10.05 or 3 × 10 or 30	M1 *Aa*	
	10.05 and No or 30.15 and 30 and No	A2 *I,I*	A1 10.05 or 30.15 and 30 or A1ft correct conclusion for their value(s) if both method marks scored

	Additional Guidance	
2(a)	60 × 3 × 12 in any order	M1M0
	Using an incorrect value from the council tax table can score up to 3 marks The value must be seen Eg 987 used (Mossett A) Alt 3 987 ÷ 3 = 329 329 ÷ 10 = 32.9(0) Yes	 M1 M1A0A1ft

Question	Answer	Mark	Comments
2(b)	1389	B1 *Rb*	
	their 1389 ÷ 100 × 25 or their 1389 ÷ 4 or 347.(25)	M1 *Rc*	347.(25) implies B1 their 347.(25) must be less than their 1389 M2 for their 1389 × 0.75
	their 1389 – their 347.(25)	M1 *Aa*	
	[1041,1042] and Yes	A2ft *I,I*	ft their 1389 if a council tax value A1ft [1041,1042] or A1ft correct conclusion for their value if 2nd method mark scored
	Additional Guidance		
	Using a different council tax value can score B0M2A2 eg 1588 ÷ 4 = 397 1588 – 397 = 1191 Yes		B0M1 M1A2ft
	Incorrect calculation of 25% can still gain 3 marks eg 1389 – 25 = 1364 Yes		B1M0M1A0A1ft

Question	Answer	Mark	Comments
2(c)	2580 × 8 or 20640 or 2580 × 0.08 or 206.4(0)	M1 *Aa*	
	£206.40 or 20 640p	A1 *I*	must see £ symbol or p symbol condone £206.40p
	Additional Guidance		

Question	Answer	Mark	Comments
2(d)	**Alternative method 1**		
	1682 – 1495	M1 *Ra*	
	(£)187	A1 *Aa*	allow (£)18.7(0) per month
2(d) check	reverse method or estimate for example their 1495 + their 187 = their 1682 or their 1682 – their 187 = their 1495 or their 1700 – their 1500 = their 200 or their 1680 – their 1500 = their 180	B1ft *Ab*	
2(d)	**Additional Guidance**		
	Mark holistically		
	Do not allow misreads		

Question	Answer	Mark	Comments
3(a)	(38 × 2) + 25 or 38 + 38 + 25 or 76 + 25	M1 *Rb*	can be implied
	(£)101	A1 *Aa*	SC1 (£)88
	Additional Guidance		

Question	Answer	Mark	Comments
3(b)	**Alternative method 1**		
	80 ÷ 40 or 2	M1 *Ra*	driving time calculated may be implied by 8(am) seen
	2 + 30 mins or 2hr 30 mins or 2 + 0.5 or 2.5 hours	M1 *Aa*	condone 0.3 for 30 mins adding 2 implies first M1 oe eg 1 + 1 + 30 mins
	10 00 – their 2 hrs 30	M1 *Rc*	
	7.30(am) or 07 30	A1 *Aa*	oe 7.30 pm scores M3A0
	Alternative method 2		
	80 ÷ 40 or 2	M1 *Ra*	driving time calculated may be implied by 8(am) seen
	10 – their 2 or 8 or 10 – 30 mins or 9.30	M1 *Aa*	subtracting 2 implies first M1 oe eg 10 – 1 – 1 condone 0.3 for 30 mins
	their 8 – 30mins or their 8 – 0.5 or their 9.30 – their 2	M1 *Rc*	condone 0.3 for 30 mins
	7.30(am) or 07 30	A1 *Aa*	oe 7.30 pm scores M3A0
	Additional Guidance		
	For 7.30 allow ½ past 7 , half 7, 30 mins to/before 8		
	7.5(0) hours or 7h 30 mins		A0

Question	Answer	Mark	Comments
3(c)	Fully correct plan with the 4 possible activities	B5 *Ra, Aa, I, I, I*	B4 plan with the 4 possible activities but with a time error or correct plan with the 4 possible activities but with start times omitted (start times implied by end time of previous activity) B3 correct plan with the 4 possible activities but with end times omitted (no evidence of completing before start of elves) or any 3 activities added with correct sequential start and end times B2 any 2 activities added with correct sequential start and end times B1 one activity added with correct sequential start time or shows that the 4 possible activities fit within the time available
	Additional Guidance		
	The two correct plans are Sleigh ride, Reindeer, Winter Crafts and ice skating-finishing at 15.30 with all start and end times included and correct or Sleigh ride, Reindeer, Winter Crafts and Treasure Hunt-finishing between 15.20 and 15.30 with all start and end times included and correct. In this plan the extra 10 minutes can included anywhere (can be more than one 'break' but all adding to 10 mins) Sequential times mean that the start time of the next activity must start at or after the stated end time of the previous activity. Activities must be from the list of 5 –Adding an extra 'Elves' visit is not included For the final B1 they can add the 4 activity lengths (correctly) and show the total fits in the available 2h 10, or subtract sequentially from 2h10 12 hr or 24 hr clock may be used		

Question	Answer	Mark	Comments
3(d)	410 + 450 + 545 or 1405	M1 *Ra*	calculating total cost of one of each lodge type
	3 × 450 or 1350	M1 *Rb*	calculating total cost for 3 'sleep 5' lodges
	their 1405 – their 1350 or their 1405 – 50 or their 1350 + 50	M1 *Aa*	their 1405 must be from adding one of each lodge size for the same date their 1350 must be from 3 × a 'sleeps 5' lodge
	55 and Yes or 1355 and 1350 and Yes or 1405 and 1400 and Yes	A2 *I,I*	A1 55 or 1355 and 1350 or 1405 and 1400 or A1ft correct decision for their value(s) if third M1 awarded
	Additional Guidance		
	1350 and 1405 and yes		M1M1M0A0A0
	1350 and 1405 and she'll save (£)55		M1M1M1A1A0
	Check table for working		

Question	Answer	Mark	Comments
4(a)	Draws one more triangle of correct size	M1 *Ra*	mark intention tolerance less than ½ square from correct vertices
	Draws at least two complete rows or columns of triangles of the correct size	M1 *I*	can be one row and one column
	Fills the grid with triangles of the correct size and shows indication of counting to 15	A1 *Aa*	
	Additional Guidance		
	Sides do not have to be ruled.		
	Edges can be implied eg at bottom border of grid		

Question	Answer		Mark	Comments
4(b)	**Alternative method 1**			
	2 ×100 or 200 (cm = 2 m)		M1 *Rb*	
	their 200 ÷ 40 or 5		M1 *Rc*	
	60 ÷ their 5 or 12	18 ÷ 1.5(0) or 12	M1 *Aa*	
	12 × 1.5(0) =18	12 × 5 = 60	A1 *I*	with all methods(except cm to m conversion) shown in full
	Alternative method 2			
	2 ×100 or 200 (cm = 2 m)		M1 *Rb*	
	18 ÷ 1.5(0) or 12		M1 *Rc*	
	their 12 × their 200 or 2400		M1 *Aa*	
	2400 ÷ 40 = 60		A1 *I*	with all methods(except cm to m conversion) shown in full
	Alternative method 3			
	60 × 40 or 2400		M1 *Rb*	
	their 2400 ÷ 100 or 24		M1 *Rc*	
	their 24 ÷ 2 or 12		M1 *Aa*	
	12 × 1.50 = 18		A1 *I*	with all methods(except cm to m conversion) shown in full

Question	Answer	Mark	Comments
4(b) cont'd	**Alternative method 4**		
	2 ×100 or 200	M1 *Rb*	
	their 200 ÷ 40 or 5	M1 *Rc*	
	(£)1.5(0) ÷ 5 = 0.3 or 30p	M1 *Aa*	cost of ribbon per card
	0.3(0) × 60 = 18 or 18 ÷ 0.3 = 60	A1 *I*	with all methods(except cm to m conversion) shown in full
	Additional Guidance		
	Full methods must be shown for the A1 but allow conversion of cm to m without method seen Example 5 bows per roll (200 implied) needs 12 rolls 12 × £1.50 = 18 Methods were not seen to get to 5 or 12 Example 200 ÷ 40 = 5 60 ÷ 5 = 12 12 × £1.50 = £18		M1M1 M1 A0 M1M1M1A1
	Other variations on the methods are possible eg by starting with 18 ÷ 60 = 0.3 or 30p per card and then showing that the ribbon costs 30p per card (Alt 4 with order changed)		

4(c)	60 ÷ 10	M1 *Rc*	
	6	A1 *Aa*	
4(c) check	6 × 10 = 60 or 60 ÷ 6 = 10 or 10 + 10 + 10 + 10 + 10 + 10 = 60	B1 *Ab*	
	Additional Guidance		

Question	Answer	Mark	Comments
4(d)	**Alternative method 1**		
	their 6 × 7.5(0) or 45	M1 *Ra*	ft their number of packs from part b
	their 45 + 4 + 18 + 5.6(0) or 72.6(0)	M1 *Rc*	totals all costs must include at least 1 pack of card blanks 72.6(0) implies M2
	60 × 2.75 or 165	M1 *Aa*	total income
	their 165 – their 72.6(0) or their 72.6(0) + 90 or 162.6(0) or their 165 – 90 or 75	M1 *Aa*	their 165 must be from attempt at total cost of cards their 72.6(0) must include at least the 3 values in the table. Condone 0 packs of card blanks here. (costs = 27.6(0))
	92.4(0) and Yes or 165 and 162.6(0) and Yes or 72.6(0) and 75 and Yes	A2ft *I,I*	ft their number of packs in b A1ft 92.4(0) or A1ft 165 and 162.6(0) or A1ft 72.6(0) and 75 A1ft correct conclusion for their value(s) if 4th method mark awarded

4(d) cont'd	**Alternative method 2**		
	their 6 × 7.5(0) or 45	M1 *Ra*	ft their number of packs from part b
	their 45 + 4 + 18 + 5.6(0) or 72.6(0)	M1 *Aa*	totals all costs must include at least 1 pack of card blanks 72.6(0) implies M2
	their 72.6(0) ÷ 60 or (£)1.21	M1 *Rc*	cost of making one card
	(2.75 – their 1.21) × 60 or their 1.54 × 60	M1 *Aa*	Profit per card × 60
	92.4(0) and Yes	A2ft *I,I*	ft their number of packs in b A1 92.4(0) A1ft correct conclusion for their value if 4th method mark awarded
	Additional Guidance		
	In Alt 1 if using the 2nd or 3rd comparisons then to gain the A1ft they must have achieved the 4th method mark and have 2 values to compare –either their 165 and their 162.2(0), or their 72.6(0) and their 75		
	In Alt 1 for the 4th mark using 7.50 leads to total costs of 35.1(0) Example 7.50 + 4 + 18 + 5.60 = 35.10 60 × 2.75 = 165 165 – 35.10 = 129.90 Yes		 M0M1 M1 M1A0A1ft
	Omitting card blanks altogether can score a maximum of 3 marks Example 4 + 18 + 5.60 = 27.60 60 × 275 = 165 165 – 27.60 = 137.40 Yes		 M0M0 M1 M1A0A1ft