Functional Skills Certificate
Functional Mathematics

Level 1

Mark scheme

4367

June 2018

Version/Stage: 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.

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)	**Alternative method 1**		
	(30 + 31 + 31 + 28) × 3 and 120 × 3 = 360	B2 *I*	B1 30 + 31 + 31 + 28 or 120 × 3
	Alternative method 2		
	360 ÷ 3 = 120 and 30 + 31 + 31 + 28 = 120	B2 *I*	B1 360 ÷ 3 or 30 + 31 + 31 + 28
	Alternative method 3		
	30 × 3 and 31 × 3 and 28 × 3 and 90 + 93 + 93 + 84 = 360	B2 *I*	B1 At least two of 30 × 3 or 31 × 3 or 28 × 3 or 90 + 93 + 93 + 84
	Additional Guidance		
	(30 + 31 + 31 + 28) × 3 = 360 is not sufficient for B2. 120 must be seen. Award B1 only Beware 3 × 30 = 90 and 90 × 4 = 360 B0 30 + 30 + 30 + 30 = 120 and 3 × 120 = 360 B0		

Question	Answer	Mark	Comments
1 (b)	**Alternative method 1**		
	360 × 80 or 28 800	M1 *Ra*	
	their 28 800 ÷ 1000	M1 *Aa*	or 29 × 1000 or 29000
	28.(8) and Yes or 28800 and 29000 and Yes or 28 800 and (she would have) 200 left	A2 *I*	A1 28.(8) or A1 28800 and 29000 or A1 28800 and 200 A1ft correct decision for their value(s) if both method marks scored
	Alternative method 2		
	29 × 1000 or 29 000	M1 *Ra*	
	their 29 000 ÷ 80	M1 *Aa*	their 29 000 can be digits 29 with an incorrect number of zeros
	362(.5) and Yes	A2 *I*	A1 362(.5) or A1ft correct decision for their value if both method marks scored
	Alternative method 3		
	29 × 1000 or 29 000	M1 *Ra*	
	their 29 000 ÷ 360	M1 *Aa*	their 29 000 can be digits 29 with an incorrect number of zeros
	80.5(…) or 80.6 and Yes	A2 *I*	A1 80.5(…) or 80.6 or A1ft correct decision for their value if both method marks scored

1(b) cont'd	**Alternative method 4**		
	1000 ÷ 80 or 12.5	M1 *Ra*	
	their 12.5 × 29	M1 *Aa*	
	362(.5) and Yes	A2 *I*	A1 362(.5) or A1ft correct decision for their value if both method marks scored
	Additional Guidance		
	Examples of incorrect conversions eg 1 29kg = 2900g 2900 ÷ 80 = 36.25 No M0M1A0A0ft eg 2 29 ÷ 80 = 0.3625 and No M0M1A0A0ft for eg 2 if a student then multiplied by 1000 to give 362.5 and yes, they would gain full marks eg 3 29 × 1000 = 2900 2900 ÷ 80 = 36.25 No M1M1A0A1ft		

Question	Answer	Mark	Comments
1 (c)	**Alternative method 1**		
	their 28 800 ÷ 2 or 14 400	M1 *Ra*	or 80 ÷ 2 × 360
	their 14 400 ÷ 200 or 72	M1 *Rc*	their 14 400 can be their 28 800 or 29 000 or 14 500 or their 28 800 × 2 or 29 000 × 2
	their 72 × 34 or 2448 or their 72 × 0.34 or 24.48	M1 *Rc*	their 72 cannot be 200
	(£)24.48	A1ft *Aa*	ft their 28 800 from (b)
	Alternative method 2		
	80 ÷ 2 or 40	M1 *Ra*	implied by 5 seen
	360 ÷ (200 ÷ their 40) or (360 × 40) ÷ 200 or 360 ÷ 5 or 72	M1 *Rc*	
	their 72 × 34 or 2448 or their 72 × 0.34 or 24.48	M1 *Rc*	their 72 cannot be 200
	(£)24.48	A1 *Aa*	
	Additional Guidance		
	Not halving the amount for the lard can gain the 2nd and 3rd method marks only eg 80 × 2 = 160 160 × 360 = 57600 M0 57600 ÷ 200 =288 M1 288 × 34p = £97.92 M1 A0		

	Beware of 360 × 2 × 34 = 244.80 or 200 × 0.34 × 360 =24480 These score no marks even if then changed to 24.48 360 × 0.34 does not gain credit unless further method is seen (eg dividing by 5)

Question	Answer	Mark	Comments
1 (d)	**Alternative method 1-comparing totals**		
	3 + 4 + 3 + 5 + 3 + 2 + 6 + 2 + 5 + 5 or 38 or 5 + 2 + 4 + 5 + 3 + 6 + 3 + 2 + 7 + 6 or 43	M1 *Aa*	
	38 and 43 and Yes or 38 and 43 and 5 more	A2 *I*	A1 38 and 43 or A1ft correct decision for their values
	Alternative method 2-comparing means		
	3 + 4 + 3 + 5 + 3 + 2 + 6 + 2 + 5 + 5 or 38 or 5 + 2 + 4 + 5 + 3 + 6 + 3 + 2 + 7 + 6 or 43	M1 *Aa*	
	3.8 and 4.3 and Yes	A2 *I*	A1 3.8 and 4.3 or A1ft correct decision for their values
	Alternative method 3-comparing medians		
	2, 2, 3, 3, 3, 4, 5, 5, 5, 6 or 3.5 or 2, 2, 3, 3, 4, 5, 5, 6, 6, 7 or 4.5	M1 *Aa*	ordering at least6 values or finds one median
	3.5 and 4.5 and Yes	A2 *I*	A1 3.5 and 4.5 or A1ft correct decision for their values

<table>
<tr><td rowspan="5">1(d) cont'd</td><td colspan="3">Alternative method 4-comparing differences</td></tr>
<tr><td>Jenny
-2,+2,-1,(0),(0),-4,+3,(0),-2,-1
or
-10 +5
or
Emma
+2,-2,+1,(0),(0),+4,-3,(0),+2,+1
or
(+)10 – 5</td><td>M1
Aa</td><td>Condone one error or omission</td></tr>
<tr><td>Yes Jenny had 5 less
or
Yes Emma had 5 more</td><td>A2
I</td><td>A1 5 or -5 from correct method
or
A1ft correct decision for their values</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="3">If a student is attempting to work out the means you must mark using Alt 2. Do not ignore as further work
Example
38 ÷ 10 = 0.38, 43 ÷ 10 = 0.43 Yes M1A0A1ft
Beware – Emma sees more on 5 days scores M0A0</td></tr>
</table>

Question	Answer	Mark	Comments
2 (a)	6 × 39 or 234	M1 *Rb*	step 1
	their 234 ÷ 4	M1 *Rc*	step 2
	58.5	A1 *Aa*	Accept $\frac{117}{2}$
check	reverse or alt calculation eg 58.5 × 4 = 234	B1 *Ab*	
2(a)	**Additional Guidance**		
	Condone alternative order of multiplying and dividing (step 1 6 ÷ 4 or 1.5, step 2 their 1.5 × 39) Mark holistically so method can be seen in check and check can be seen in main answer space Ignore units		

2 (b)	14 × 16 = 224 or 224 ÷ 14 = 16 or 224 ÷ 16 = 14	B1 *I*	
	Additional Guidance		
	Must be full working with answer so just 14 × 16 is not enough Ignore units		

Question	Answer	Mark	Comments
2 (c)	**Alternative method 1**		
	224 ÷ 5 or 44.8	M1 *Ra*	
	45	A1 *I*	
	their 45 × 53.75	M1 *Aa*	their 45 must be an integer their 45 cannot be 5 or 2500 or 224
	2418.(75) and Yes	A2 *I*	A1 2418.(75) or A1 ft correct conclusion for their value if one method mark scored
	Alternative method 2		
	2500 ÷ 53.75 or 46.5(…)	M1 *Ra*	
	46	A1 *I*	number of bags he can buy for 2500
	their 46 × 5	M1 *Aa*	their 46 must be an integer
	230 and Yes	A2 *I*	A1 230 or A1 ft correct conclusion for their value if one method mark scored
	Additional Guidance		
	If 44.8 is not rounded then the answer should be 2408 and Yes M1A0M0A0A1ft Multiplying by 224 first gives the same incorrect answer 53.75 × 224 =12040 12040 ÷ 5 =2408 Yes M1A0M0A0A1ft (M1 for equivalent of 224 ÷ 5)		

Question	Answer	Mark	Comments
2 (d)	5 by 5 square drawn or at least one 2 by 2 square drawn	B1 *Ra*	anywhere in the grid
	at least one 7.5 by 4 rectangle drawn	B1 *Aa*	anywhere in the grid
	two 7.5 by 4 rectangles or three 2 by 2 squares	B1 *Aa*	anywhere in the grid
	at least 1 swing set in the north half and all their rockers in the south half	B1 *I*	Whole swing set must be in north half May be an incorrect number of rockers Do not have to be correct size-can be pictures of swings/rockers
	Correct number and size of each type of item labelled at least once	B1 *I*	Do not have to be in the correct half of the play area
	Additional Guidance		
	Lines do not need to be ruled Mark intention with measurements less than a quarter square out They can label just one swing set and/or just one rocker provided it is clear which items are the same		

3 (a)	£160	B1 *Rb*	
	Additional Guidance		

Question	Answer	Mark	Comments
3 (b)	**Alternative method 1**		
	2 × 240 + 2 × 110 or 480 + 220 or 700	M1 *Ra*	
	their 700 – 599 or their 700 – 100	M1 *Aa*	their 700 must be their total for at least one adult and one child
	(£)101 and Yes or 600 and 599 and Yes	A2 *I*	A1 (£)101 or A1ft correct decision for their value(s) if clearly compared with 599
	Alternative method 2		
	2 × 240 + 2 × 110 or 480 + 220 or 700	M1 *Ra*	
	599 + 100 or 699	M1 *Aa*	
	(£)700 and (£)699 and Yes	A2 *I*	A1 (£)700 and (£)699 or A1 ft correct decision for their (£)700 and (£)699 where their 700 is for at least one adult and one child
	Additional Guidance		
	For A1ft their 700 must be for at least one adult and one child **and** 599 must be seen or used Eg 1 480 + 220 = 700 Yes M1M0A0A0ft Eg 2 480 + 220 = 700 Yes the family ticket is 599 M1M0A0A1ft Eg 3 480 + 220 = 700 they save more than £100 as the family ticket is only 599 M1M0A0A1ft		

Question	Answer	Mark	Comments
3 (c)	$\frac{15}{60}$ or $\frac{1}{4}$ (hour) or 60 ÷ 15 or 4 or 892 ÷ 60 or 14.(8…) or 14.9	M1 *Rc*	Implied by division by 4
	892 × their $\frac{1}{4}$ or 892 ÷ their 4 or their 14.8(…) × 15 or 892 ÷ 2 ÷ 2	M1 *Rb*	Their $\frac{1}{4}$ or their 4 must be from attempting fraction of an hour or number of 15 mins in an hour their 14.(8…) must be an attempt at calories per minute
	223	A1 *Aa*	SC2 172
	Additional Guidance		
	892 ÷ 60 × 15 implies M2 892 ÷ 2 ÷ 2 implies M2 Truncating 14.8…to 14 gives a final answer of 210 and scores M2A0		

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="5">3(d)

3 (d)</td><td>Amy and Kim each work 4 days</td><td>B1
Ra</td><td></td></tr>
<tr><td>Sal and Tom each work 3 days</td><td>B1
I</td><td></td></tr>
<tr><td>Two different trainers each day and nobody working more than two days in a row</td><td>B1
I</td><td></td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="3">Example of fully correct rota
<table>
<tr><th></th><th>Trainer 1</th><th>Trainer 2</th></tr>
<tr><td>Monday</td><td>Amy</td><td>Kim</td></tr>
<tr><td>Tuesday</td><td>Sal</td><td>Tom</td></tr>
<tr><td>Wednesday</td><td>Sal</td><td>Tom</td></tr>
<tr><td>Thursday</td><td>Amy</td><td>Kim</td></tr>
<tr><td>Friday</td><td>Amy</td><td>Kim</td></tr>
<tr><td>Saturday</td><td>Sal</td><td>Tom</td></tr>
<tr><td>Sunday</td><td>Amy</td><td>Kim</td></tr>
</table>
If there are any blanks then award a maximum of B1 for either, Amy and Kim each work 4 days or Sal and Tom each work 3 days.
Mark final grid unless blank</td></tr>
</table>

Question	Answer	Mark	Comments
3 (e)	450 × 2	M1 *Rc*	
	900	A1 *Aa*	
Check	Reverse or alt method eg their 900 ÷ 450 = 2 or their 900 ÷ 2 = 450	B1ft *Ab*	
	Additional Guidance		

Question	Answer	Mark	Comments
4 (a)	**Alternative method 1**		
	6 × 5 or 30 or 6 × 3 or 18	M1 *Ra*	
	125 – their 30 or 95	M1 *Rb*	their 30 cannot be their 18
	75 + their 18 or 93	M1 *Aa*	their 18 cannot be their 30
	95 and 93	A1 *I*	
	Alternative method 2		
	6 × 5 or 30 or 6 × 3 or 18	M1 *Ra*	
	125 – their 30 or 95	M1 *Rb*	their 30 cannot be their 18
	their 95 – 75 or 20	M1 *Aa*	
	20 and 18	A1 *I*	
	Alternative method 3		
	6 × 5 or 30 or 6 × 3 or 18	M1 *Ra*	
	their 30 + their 18 or 48	M1 *Aa*	
	125 – 75 or 50	M1 *R*	
	48 and 50	A1 *I*	

	Additional Guidance

Question	Answer	Mark	Comments
4 (b)	£6	B1 *Aa*	
	Additional Guidance		

Question	Answer	Mark	Comments
4 (c)	7.5(0) and 5.6(0) and 5.4(0) and 1.55	B2 *Aa Aa*	B1 any 2 correct
	33.9(0)	B1ft *Aa*	ft their total if at least 2 correct values are seen
	Additional Guidance		
	The 4 given values total £13.85 If their only error is to write 15.50 instead of 1.55 then the total should be 47.85 Scores B1B1		
4 (d)	**Alternative method 1**		
	(35 × 1.2(0)) ÷ 2	M1 *Aa*	
	21 and No	A2 *I I*	A1 21 A1ft correct conclusion for their value SC1 42 and Yes
	Alternative method 2		
	(40 × 2) ÷ 1.2(0) (40 × 2) ÷ 35	M1 *Aa*	
	66(.6…) or 66.7 or 67 and No 2.28(…) or 2.29 and No	A2 *I I*	A1 66(.6…) or 66.7 or 67 or 2.28(…) or 2.29 A1ft correct conclusion for their value SC1 33.(3…) and Yes or SC1 1.14(…) and Yes
	Additional Guidance		

<table>
<tr><td rowspan="11">4 (e)</td><td colspan="5">Alternative method 1</td></tr>
<tr><td colspan="2">24 500 ÷ 100 or 245</td><td>M1
Ra</td><td>or 24 500 × 3
or 73 500</td><td rowspan="2">24 500 × 0.03 is M2</td></tr>
<tr><td colspan="2">their 245 × 3 or 735</td><td>M1
Rc</td><td>or their 73 500 ÷ 100 or 735</td></tr>
<tr><td>their 735 + 90</td><td>820 – their 735</td><td>M1
Aa</td><td colspan="2">their 735 must be from multiplication of digits 245 by 1,3 or 4</td></tr>
<tr><td>825 and No</td><td>85 and No</td><td>A2
I I</td><td colspan="2">A1 825 or 85
A1ft correct conclusion for their value if 3rd M1 awarded</td></tr>
<tr><td colspan="5">Alternative method 2</td></tr>
<tr><td colspan="2">820 – 90 or 730</td><td>M1
Ra</td><td colspan="2"></td></tr>
<tr><td colspan="2">their 730 ÷ 3 or 243.(…)</td><td>M1
Rc</td><td colspan="2"></td></tr>
<tr><td colspan="2">their 243.(…) × 100</td><td>M1
Aa</td><td colspan="2">their 243.(..) must be from division by 1,3 or 4</td></tr>
<tr><td colspan="2">[24 300, 24 334] and No</td><td>A2
I I</td><td colspan="2">A1 [24 300, 24 334]
A1ft correct conclusion for their value if 3rd M1 awarded</td></tr>
<tr><td colspan="5">Additional Guidance</td></tr>
<tr><td colspan="5">Using 1p or 4p per point can gain M1M0M1A0A1ft
Example with 4p per point
24 500 × 4 ÷ 100 = 980
No he has enough for the holiday (3rd M1 allowed as they do not need to subtract from 820)
Example with 1p per point
24 500 ÷ 100 (×1) =245
820 – 245 = 575 No
Using either 1p or 3p or 4p may be implied by the digits 245, 735 or 980</td></tr>
</table>

Question	Answer	Mark	Comments
4 (f)	0.1 × 58 or 5.8(0) or 580(p) or (£)5.80p	M1 *Rc*	52.2(0) implies M1
	£5.80 or 580p	A1 *I*	must be correct money notation must have £ or p condone £5.80p
	Additional Guidance		
	5.8 seen scores M1 (even if choice) subtracting the discount can score 1 mark example 58 ÷ 10 = 5.8(0) 58 – 5.8(0) = 52.20 M1A0		