



Functional Skills Certificate

MATHEMATICS

Level 1

Mark scheme

4367

November 2015

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.

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 $\frac{1}{2}$

Q	Answer	Mark	Comment																																																																																																																								
1(a)	<p>Fully correct response</p> <p>Eg1</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>B</td> <td>F</td> <td>C</td> <td>E</td> </tr> <tr> <td>Team 2</td> <td>E</td> <td>F</td> <td>D</td> <td>A</td> </tr> <tr> <td>Team 3</td> <td>B</td> <td>C</td> <td>D</td> <td>A</td> </tr> </tbody> </table> <p>Eg2</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>E</td> <td>C</td> <td>F</td> <td>B</td> </tr> <tr> <td>Team 2</td> <td>D</td> <td>A</td> <td>B</td> <td>F</td> </tr> <tr> <td>Team 3</td> <td>E</td> <td>C</td> <td>A</td> <td>D</td> </tr> </tbody> </table>		Girls				Team 1	B	F	C	E	Team 2	E	F	D	A	Team 3	B	C	D	A		Girls				Team 1	E	C	F	B	Team 2	D	A	B	F	Team 3	E	C	A	D	<p>B4 / / / Rb Rc</p>	<p>B3 Exactly one of the criteria not met with no blanks and all girls used Eg1 (Amy in Team 1 and Team 3)</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>B</td> <td>F</td> <td>A</td> <td>E</td> </tr> <tr> <td>Team 2</td> <td>E</td> <td>F</td> <td>D</td> <td>C</td> </tr> <tr> <td>Team 3</td> <td>B</td> <td>C</td> <td>D</td> <td>A</td> </tr> </tbody> </table> <p>Eg2 (Fay not in exactly 2 races)</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>E</td> <td>D</td> <td>F</td> <td>B</td> </tr> <tr> <td>Team 2</td> <td>C</td> <td>A</td> <td>B</td> <td>D</td> </tr> <tr> <td>Team 3</td> <td>E</td> <td>D</td> <td>A</td> <td>C</td> </tr> </tbody> </table> <p>B2 Exactly two of the criteria not met Eg1 (Amy in Team1 and 3 Beth not in Team 1)</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>E</td> <td>F</td> <td>A</td> <td>D</td> </tr> <tr> <td>Team 2</td> <td>B</td> <td>F</td> <td>E</td> <td>C</td> </tr> <tr> <td>Team 3</td> <td>B</td> <td>C</td> <td>D</td> <td>A</td> </tr> </tbody> </table> <p>Eg2 (Fay not in exactly 2 races Beth not in Team1)</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>E</td> <td>C</td> <td>F</td> <td>D</td> </tr> <tr> <td>Team 2</td> <td>C</td> <td>A</td> <td>B</td> <td>D</td> </tr> <tr> <td>Team 3</td> <td>E</td> <td>C</td> <td>A</td> <td>B</td> </tr> </tbody> </table>		Girls				Team 1	B	F	A	E	Team 2	E	F	D	C	Team 3	B	C	D	A		Girls				Team 1	E	D	F	B	Team 2	C	A	B	D	Team 3	E	D	A	C		Girls				Team 1	E	F	A	D	Team 2	B	F	E	C	Team 3	B	C	D	A		Girls				Team 1	E	C	F	D	Team 2	C	A	B	D	Team 3	E	C	A	B
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Q	Answer	Mark	Comment																				
			<p>B1 At least one of the criteria correct but with gaps eg</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>B</td> <td>F</td> <td></td> <td></td> </tr> <tr> <td>Team 2</td> <td>A</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Team 3</td> <td>A</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>or B1 All girls used but no criteria met fully (Do not allow repeats in a team)</p>		Girls				Team 1	B	F			Team 2	A				Team 3	A			
	Girls																						
Team 1	B	F																					
Team 2	A																						
Team 3	A																						

1 (a)	Additional guidance																						
	Accept any clear indication of girls names																						
	Mark the final response unless blank when you can mark the first grid																						
	<p>If a girl is selected twice for the same race, deduct 1 mark from B4, B3 and B2 response eg</p> <table border="1"> <thead> <tr> <th></th> <th colspan="4">Girls</th> </tr> </thead> <tbody> <tr> <td>Team 1</td> <td>B</td> <td>F</td> <td>B</td> <td>F</td> </tr> <tr> <td>Team 2</td> <td>A</td> <td>C</td> <td>D</td> <td>E</td> </tr> <tr> <td>Team 3</td> <td>A</td> <td>C</td> <td>D</td> <td>E</td> </tr> </tbody> </table> <p>covers all 3 criteria for B4 but repeats names in a team</p>			Girls				Team 1	B	F	B	F	Team 2	A	C	D	E	Team 3	A	C	D	E	B3
	Girls																						
Team 1	B	F	B	F																			
Team 2	A	C	D	E																			
Team 3	A	C	D	E																			
	If a girl is selected three or four times for the same race, award a maximum of B1																						
	If entries are blank, award a maximum of B1																						
	B3 If a girl appears 3 times then a different girl automatically only appears once – take this to be only one of the criteria not met																						

Q	Answer	Mark	Comment
1 (b)	Alternative method 1		
	26.5 (s) – 0.13 (s) or 26.37 (s)	M1 <i>Ra</i>	
	5.19 (m) + 0.2 (m) or 5.39 (m)	M1 <i>Rc</i>	
	Reads correct points for their 26.37 (s) or their 5.39 m	M1 <i>Rb</i>	765 if 26.37 correct 668 if 5.39 correct
1(b)	Attempt at new points total ie 570 + their 668 + 655 + 884 + their 765 + 887 + 550	M1 <i>Aa</i>	their 765 – 754 or 11 and their 668 – 612 or 56 and 4912 + their 11 + their 56
	4979 and No	A2 <i>/</i>	A1 4979 A1ft Correct ft decision for their 4979 if 4 th M1 is awarded
	Alternative method 2		
	26.5 (s) – 0.13 (s) or 26.37 (s)	M1 <i>Ra</i>	
	5.19 (m) + 0.2 (m) or 5.39 (m)	M1 <i>Rc</i>	
	Reads points for their 26.37 (s) or their 5.39 m	M1 <i>Rb</i>	765 if 26.37 correct 668 if 5.39 correct
	5000 – 4912 or 88 and their 765 – 754 or 11 and their 668 – 612 or 56 and their 88 – their 11 – their 56	M1 <i>Aa</i>	5000 – 4912 or 88 and their 765 – 754 or 11 and their 668 – 612 or 56 and their 11 + their 56 or 67

Q	Answer	Mark	Comment
1(b) cont'd	21 and No or 88 and 67 and No	A2 /	A1 21 or 88 and 67 A1ft Correct ft decision for their 21 or for their 88 and their 67 if 4 th M1 is awarded
	Additional guidance		
	Their 668 must be a points value form the 200m table Their 765 must be a points value from the long jump table Their 11 and their 56 must be from subtracting values from the tables.		
	If incorrect points are seen, only award the first M1 for a correct method seen eg 767 points for 220m with no method shown is M0 One exception is condone 617 for long jump as evidence of attempted addition of 5.39 + 0.2		
	If they add 0.13 s, maximum mark is		M0 M1 M1 M1 A1ft
	If they subtract 0.2 m, maximum mark is		M1 M0 M1 M1 A1ft
	If they add 0.13 s and subtract 0.2 m, maximum mark is		M0 M0 M1 M1 A1ft

Q	Answer	Mark	Comment
1(c)	3 large and 1 small and £380	B4 <i>Ra Rc / Aa</i>	Must be communicated clearly B3 3 large and 1 small with no cost or incorrect cost or B3 $3 \times 105 + 65 = 380$ Correct answer but poorly communicated B2 Any other combination of buses that carry between 100 and 120 passengers and correct cost 4 large (£)420 2 large and 3 small (£)405 1 large and 5 small (£)430 7 small (£)455 B1 for any of the combinations above either with no cost, incorrect cost, or not clearly communicated or B1 correct cost of at least 2 buses
	Additional Guidance		
	For communication the bus sizes must be explicitly stated eg1 $3 \times 30 + 1 \times 16$ so 3L, 1S cost 380 eg2 $3 \times 105 + 1 \times 65 = 380$ eg 3 4 large = 420 eg 4 $2 \times 30 + 3 \times 65 = 405$	B4 B3 B2 B1	
2(a)	1400 g	B1 <i>Ra</i>	

Q	Answer	Mark	Comment
2(b)	240 ÷ 48 or 5	M1 Ra	
	Their 5 × £3.25	M1 Aa	240 ÷ 48 × 3.25 in nay order implies M2
	£16.25	A1 Aa	
2(b) Check	Reverse or alt calculation Eg 16.25 ÷ 5 = 3.25	B1 Ab	
	Additional Guidance		
	Mark holistically so answer can be in the check and two alt methods in the main body may imply the check		

Q	Answer	Mark	Comment
2(c)	Alternative method 1		
	180 ÷ 40 or 4 (.5) Or 135 ÷ 40 or 3(.3...)	M1 <i>Rb</i>	
	180 ÷ 40 or 4 (.5) and 135 ÷ 40 or 3(.3...)	M1 <i>Rc</i>	
	Their 4 × their 3	M1 <i>Aa</i>	Must be integers and must be rounded down
	12 and No	A2 <i>/</i>	A1 12 A1ft correct conclusion for their value if 1 st and 3 rd M1 awarded
2(c)	Alternative method 2		
	Draws one row of 4 Or Draws one column of 3	M1 <i>Rb</i>	
	Draws one row of 4 and Draws one column of 3	M1 <i>Rc</i>	
	Draws 12 'squares' Or Their 4 × their 3	M1 <i>Aa</i>	
	12 and No	A2 <i>/</i>	A1 12 A1ft correct conclusion for their value if 1 st and 3 rd M1 awarded
	Additional Guidance		
	'squares' drawn do not have to be accurate but there must be the correct number (with possibly space left)		

Q	Answer	Mark	Comment
2 (d)	Alternative method 1		
	1.32 + 1.44 or 2.76	M1 <i>Rb</i>	
	Their 2.76 ÷ 2 or their 2.76 × 0.5 or 1.38	M1 <i>Aa</i>	
	Their 2.76 + their 1.38	M1 <i>Aa</i>	
	4.14 and Yes or 53(.9..) % or 54% and Yes	A2 <i>/</i>	A1 4.14 or 53(.9..) % or 54% A1ft correct conclusion for their values
	Alternative method 2		
	1.32 + 1.44 or 2.76	M1 <i>Rb</i>	
	4.25 – their 2.76 or 1.49	M1 <i>Aa</i>	
	their $\frac{1.49}{2.76} \times 100$	M1 <i>Aa</i>	
	1.38 and 1.49 and Yes	A2 <i>/</i>	A1 1.38 and 1.49 A1ft correct conclusion for their values
	Alternative method 3		
	1.32 ÷ 2 or 0.66 Or 1.44 ÷ 2 or 0.72	M1 <i>Rb</i>	oe
	1.32 + 0.66 or 1.98 and 1.44 + 0.72 or 2.16	M1 <i>Aa</i>	oe

Q	Answer	Mark	Comment
	their 1.98 + their 2.16	M1 Aa	
	4.14 and Yes	A2 /	A1 4.14 A1ft correct conclusion for their value
Additional Guidance			
Accept any method for working out 50% but build up method must get to 50%			

3(a)	17:40	B1 Rb	oe eg 5.40
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3(b)	10:40 or 11: 45 train from Pickering	B1 Ra	
	Correct arrival time for their train and chosen station	B1ft Rb	ft their train 10:40 → 11:00 Levisham or 11:09 Newton Dale 11:45 → 12:14 Newton Dale
	Adds on time for walk (Levisham 4 hours, Newton Dale 3 hours)	B1 Aa	
	Chooses possible return time to allow at least 30 minutes for picnic or adds at least 30 mins to their time for the end of the walk	B1 /	
	Correct return time to Pickering following their end time for walk/picnic	B1 /	Earliest possible return is 15:40
	Clearly communicated plan with all times and places seen including mention of picnic	B1 /	Must include depart and arrive times for trains going out and coming back and times to start and finish the walk and picnic (which may be combined)

Q	Answer	Mark	Comment
3(c)	$9.5(0) \times 3$	M1 Rb	
	£28.50	A1 /	Must have £ sign and correct money notation SC1 £66.50
3(c) Check	$28.5(0) \div 3 = 9.5(0)$ or $28.5(0) \div 9.5(0) = 3$ or alt method to multiply 9.5(0) by 3	B1 Ab	
3(c)	Additional Guidance		
	28.50 is A0 (no £ sign), £28.5 is A0 Allow 28 pounds and 50 pence		

Q	Answer	Mark	Comment
3(d)	Alternative method 1		
	2 × 19 + their 28.5(0) or 66.5(0)	M1 Rc	ft their c
	their 66.5(0) – 42 or their 66.5(0) – 25 or 42 + 25 or 67	M1 Aa	
	24.50 and No or 41.50 and No or 66.5(0) and 67 and No	A2ft /	ft their c A1 24.50 or 41.50 or 66.5(0) and 67 A1ft correct decision for their value Must be cost for children and adults
	Alternative method 2		
	42 + 25 or 67	M1 Rc	ft their c
	their 67 – (their 28.5(0) + (2×19))	M1 Aa	or their 67 – their 28.5(0) or 38.5(0) or their 67 – (2× 19) or 29
	50p short (of £25) and No or 38.5(0) and 38 and No or 28.5(0) and 29 and No	A2ft /	ft their c A1 50p short (of £25) or 38.5(0) and 38 or 29 and 28.5(0) A1ft correct decision for their values
	Additional Guidance		
	Ft their answer to part c for the cost for 3 children		
For the conclusion allow 24.50 and it will be cheaper by less than (£)25			

Q	Answer	Mark	Comment
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4(a)	Alternative method 1		
	500 + 600 + 500 + 600 or 2200	M1 Rc	
	Their 2200 × 2.8(0)	M1 Aa	
	(£)6160	A1 Aa	
	Alternative method 2		
	500 × 2.8(0) or 1400 or 600 × 2.8(0) or 1680	M1 Rc	
	(their 1400 + their 1680) × 2 or 3080 × 2	M1 Aa	3080 implies first M1
	(£)6160	A1 Aa	
	Additional Guidance		
	Multiplication by 2.8(0) gains M1		

4(b)	500 × 600 or 300 000	M1 Ra	
	Their 300 000 ÷ 800	M1 Aa	
	375	A1 Aa	

Q	Answer	Mark	Comment
4(c)	Alternative method 1		
	1230 ÷ 6 or 205 or 1230 ÷ 25 or 49.2	M1 Ra	
	Their 205 ÷ 25 or Their 49.2 ÷ 6	M1 Aa	1230 ÷ 6 ÷ 25 gets M2
	8.2 or 8 hours 12 minutes and Yes	A2 /	A1 8.2 or 8 hours 12 minutes A1ft correct decision for their number of hours with M1 scored
	Alternative method 2		
	8 × 6 or 48 or 8 × 25 or 200 or 6 × 25 or 150	M1 Ra	
	Their 48 × 25 or Their 200 × 6 or 1230 ÷ their 200 or Their 150 × 8	M1 Aa	oe
	1200 and Yes or Yes there are 30 left or 6.1(..) and Yes	A2 /	A1 1200 or 6.1(..) or A1ft correct decision for their number of sheep or shearers with M1 scored

Q	Answer	Mark	Comment
Alternative method 3			
1230 ÷ 6 or 205		M1 <i>Ra</i>	Allow either order. 1230 ÷ 48 implies M2
their 205 ÷ 8		M1 <i>Aa</i>	
25.6(...) and 25 and Yes		A2 <i>/</i>	A1 25.6 (...) and 25 or A1ft correct decision for their number of sheep per hour with M1 scored
Additional Guidance			
If other alternatives are seen apply the mark scheme in the same way eg Can do 150 sheep per hour but need to do 153.75 sheep per hour so need more time			M1M1A2

4(d)	2.4 + 2.6 + 2.5 + 2.6 + 2.8 + 2.2 + 2.6 + 2.5 + 2.7 + 2.1 and 25 ÷ 10 = 2.5 or 2.5 × 10 = 25	B2 <i>Aa Rc</i>	B1 2.4 + 2.6 + 2.5 + 2.6 + 2.8 + 2.2 + 2.6 + 2.5 + 2.7 + 2.1 Allow one error or omission or B1 25 ÷ 10 = 2.5 or 2.5 × 10 = 25
	Additional Guidance		
	Just stating they add to 25 is not sufficient. Addition must be shown but may be + signs between the given numbers.		

Q	Answer	Mark	Comment
4(e)	Alternative method 1		
	2.5 × 4.2(0) or 10.5(0)	M1 Ra	
	Their 10.5(0) – 1.9(0) or 8.6(0)	M1 Aa	
	Their 8.6(0) × 1230	M1 Aa	
	10 578 and Yes	A2 /	A1 10 578 or A1ft correct decision for their value for total income – total cost
	Alternative method 2		
	2.5 × 4.2(0) × 1230 or 12 915	M1 Ra	
	1.9(0) × 1230 or 2337	M1 Aa	
	Their 12 915 – their 2337	M1 Aa	
	10 578 and Yes	A2 /	A1 10 578 or A1ft correct decision for their value for income – cost
	Additional Guidance		
For mixed calculations use the alt which gives the better mark			