

Mark Scheme (Results)

July 2017

Functional Skills Mathematics Level 2

FSM02

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FUNCTIONAL SKILLS (MATHEMATICS)
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Guidance for Marking Functional Skills Maths Papers

General

- All candidates must receive the same treatment. You must mark the first candidate in exactly the same way as you mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- All the marks on the mark scheme are designed to be awarded. You should always award full marks if deserved, i.e. if the answer matches the mark scheme. You should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

Applying the Mark Scheme

- The mark scheme has a column for **Process** and a column for **Evidence**. In most questions the majority of marks are awarded for the process the candidate uses to reach an answer. The evidence column shows the most likely examples you will see if the candidate gives different evidence for the process, you should award the mark(s).
- **Finding 'the answer'**: in written papers, the demand (question) box should always be checked as candidates often write their 'final' answer or decision there. Some questions require the candidate to give a clear statement of the answer or make a decision, in addition to working. These are always clear in the mark scheme.
- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.
- If there is a **choice of methods** shown, then mark the working leading to the answer given in the answer box or working box. If there is no definitive answer then marks should be awarded for the 'lowest' scoring method shown.
- A suspected **misread** may still gain process marks.
- It may be appropriate to **ignore subsequent work (isw)** when the candidate's additional work does not change the meaning of his or her answer.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the functional demand of the question. The mark scheme will make clear how to mark these questions.
- **Transcription** errors occur when the candidate presents a correct answer in working, and writes it incorrectly (on the answer line in a written paper); mark the better answer.
- **Incorrect method** if it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.
- **Follow through marks (ft)** must only be awarded when explicitly allowed in the mark scheme. Where the process uses the candidate's answer from a previous step, this is clearly shown. Speech marks are used to show that previously incorrect numerical work is being followed through, for example '**240**' means **their** 240.
- Marks can usually be awarded where **units** are not shown. Where units, including money, are required this will be stated explicitly. For example, 5(m) or (£)256.4 indicates that the units do not have to be stated for the mark to be awarded.

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- **Correct money notation** indicates that the answer, in money, must have correct notation to gain the mark. This means that money should be shown as £ or p, with the decimal point correct and 2 decimal places if appropriate. e.g. if the question working led to $£12 \div 5$,
Mark as correct: £2.40 240p £2.40p 2.40£ Mark as incorrect: £2.4 2.40p £240p 2.4 2.40 240
- Candidates may present their answers or working in many **equivalent** ways. This is denoted **oe** in the mark scheme. Repeated addition for multiplication and repeated subtraction for division are common alternative approaches. The mark scheme will specify the minimum required to award these marks.
- A **range** of answers is often allowed:
 - [12.5, 105] is the inclusive closed interval
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in other parts of a question, even if not explicit in the expected part. E.g. checks in on earlier answer box.
- **Graphs**

The mark schemes for most graph questions have this structure:

Process	Mark	Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph)	1 or	1 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	2 or	2 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	3	all of: linear scale(s), labels, accurate plotting (2 mm tolerance)

The mark scheme will explain what is appropriate for the data being plotted.

A **linear scale** must be linear **in the range where data is plotted**, and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. Thus a graph that is 'fit for purpose' is one where the **data is displayed clearly and values can be read**, will gain credit.

The minimum requirements for **labels** will be given, but you should give credit if a title is given which makes the label obvious.

Plotting must be correct for the candidate's scale. Candidate's scale must be in numerical order. Award the mark for plotting if you can read the values, even if the scale is not linear.

The mark schemes for **Data Collection and/ or summary Sheets** refer to **input opportunities** and to **efficient input opportunities**.

When a candidate gives an input opportunity, it is likely to be an empty cell in a table, it may be an instruction to 'circle your choice', or it may require writing in the data in words. These become efficient, for example, if there is a well-structured 2-way table, or the input is a tick or a tally rather than a written list.

Discuss any queries with your Team Leader.

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Section A: Bank

Question	Skills Standard	Process	Mark	Mark Grid	Evidence																																	
Q1	R1	Starts creating a data collection sheet	1 or	A	Data collection sheet with Input opportunities AND at least 2 of: Heading for savings account/no saving account Heading for age (18-24, 25-49, 50+) Heading for income (<£15000, £15000-£30000, >£30000) Condone questionnaire with 2 headings and options to select																																	
	I6	Improves solution	2 or	AB	Data collection sheet with Input opportunities AND all of: Heading for savings account/no saving account Heading for 18-24, 25-49, 50+ (age) Heading for <£15000, £15000-£30000, >£30000 (income) May not be efficient or in separate tables Condone fully correct questionnaire																																	
	I6	Efficient data collection sheet	3	ABC	Efficient input opportunities AND all of: Heading for savings account/no saving account Heading for 18-24, 25-49, 50+ (age) Heading for <£15000, £15000-£30000, >£30000 (income) Example of a fully correct answer <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"></th> <th colspan="3">Saving account</th> <th colspan="3">No saving account</th> </tr> <tr> <th>18-24</th> <th>25-49</th> <th>50+</th> <th>18-24</th> <th>25-49</th> <th>50+</th> </tr> </thead> <tbody> <tr> <td>< £15000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>£15000 – £30000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>> £30000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Saving account			No saving account			18-24	25-49	50+	18-24	25-49	50+	< £15000							£15000 – £30000							> £30000					
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£15000 – £30000																																						
> £30000																																						
Total marks for question			3																																			

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(a)	A4	Begins to calculate a percentage	1 or	D	178 ÷ 2479 (=0.0718..) OR Method to write one number as a percentage of another (may work with any age group) OR 7.2(%) oe OR Allow 178 ÷ 8093 (=0.0219..) Allow 178 ÷ 14157 (=0.0125..)
	I6	Correct answer accurate to 2dp	2	DE	7.18(%)
Q2(b)	R3	Starts to find median or range	1 or	F	Identifies 2400 and 2500 OR Identifies 1600 and 7500 NB if 1600 and 7500 are used in median calculation do not award this mark
	A4	Full process to find median or range	2 or	FG	(2400 + 2500) ÷ 2 (=2450) OR 7500 – 1600 (=5900)
	I6	Accurate figures	3	FGH	(£)2450 AND (£)5900
Q2(c)	A5	Valid explanation	1	J	e.g. median is not affected by the extreme value (of £7500) or mean is distorted by high value (of employee D £7500)
Total marks for question			6		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R2	Begins to work with disposable income or expenses	1 or	K	e.g. $780 + 135 + 170 (=1085)$ OR $1650 - 780 - 135 - 170 (=565)$ OR $1650 \times 12 (=19800)$ OR $780 \times 12(=9360)$ or $135 \times 12(=1620)$ or $170 \times 12 (=2040)$ OR $4000 \div 12 (=333.33..)$
	R3	Works with 60% or 12 months	2 or	KL	e.g. $'565' \times 0.6 (=339)$ oe OR $'19800' - '9360' - '1620' - '2040' (=6780)$ OR $'565' \times 12 (=6780)$ oe OR $4000 \div 12 (=333.33..) \text{ and } 1650 - 780 - 135 - 170 (=565)$
	A4	Full process to find figures to compare	3 or	KLM	$'339' \times 12 (=4068)$ oe OR $'6780' \times 0.6 (=4068)$ oe OR $'333.33..' \div 0.6 (=555.55..)$
	I7	Valid conclusion with accurate figures	4	KLMN	Yes AND (£) 4068 OR Yes AND (£)565 and (£)555(.55..)
Total marks for question			4		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R1	Process to convert between currencies	1 or	P	$265 \div 1.1452 (=231.40..)$
	A4	Full process to find total amount	2 or	PQ	$1000 + '231.40..' - 0.79 (=1230.61..)$
	I7	Correct answer accurate to the nearest penny	3	PQR	(£)1230.61
Total marks for question			3		

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Section B: Landscaping

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5(a)	R2	Draws a circle	1 or	A	Circle with diameter 10 sq lengths OR e.g. Circle with diameter 5 sq lengths, at least 3 sq lengths away from the house and 1 sq length away from the path and the fence OR evidence of working with correct scale shown in calculations or by shading restricted area correctly
	A4	Engages with constraints	2 or	AB	Circle with diameter 10 sq lengths AND one of: <ul style="list-style-type: none"> • positioned at least 6 sq lengths away from the house • positioned at least 2 sq lengths away from the path and the fence
	I6	Fully correct answer	3	ABC	Circle with diameter 10 sq lengths, at least 6 sq lengths away from the house and 2 sq lengths away from the path and the fence See example at the end of mark scheme Apply tolerance of ± 2 mm for circle

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5(b)	R1	Engages with symmetry	1	D	e.g. $1.25 \times 2 (=2.5)$ OR $0.375 \times 2 (=0.75)$ May be implied by multiplying by 2 in subsequent working OR Shows a correct figure for missing dimensions on the diagram
	R3	Process to find one relevant area	1 or	E	e.g. $'2.5' \times 0.9(=2.25)$ or $1.25 \times 0.9(=1.125)$ OR $2.3 \times '0.75'(=1.725)$ or $2.3 \times 0.375(=0.8625)$ OR $(2.3 + 0.9) \times '0.75'(=2.4)$ or $(2.3 + 0.9) \times 0.375(=1.2)$ OR $(1.25 - 0.375) \times 0.9 (=0.7875)$
	A4	Full process to find total area	2	EF	e.g. $'2.25' + '1.725'(=3.975)$ oe OR $'2.4' + 2 \times '0.7875'(=3.975)$ oe May be implied by subsequent working
	A4	Process to find the volume	1	G	e.g. $'3.975' \times 0.2 (=0.795)$ OR $'0.9' \div 0.2 (=4.5)$ Allow $'1.9875' \times 0.2 (=0.3975)$ or any relevant area Do not accept perimeter
	R2	Converts between units	1 or	H	e.g. $'0.795' \times 1000(=795)$ OR $900 \div 1000 (=0.9)$ Allow $'0.3975' \times 1000(=397.5)$ or any relevant volume
	I7	Correct answer with accurate figures	2	HJ	Yes AND 795(litres) OR Yes AND 0.795 and 0.9 (m ³) OR Yes AND 3.975 and 4.5 (m ²)
Total marks for question			9		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R3	Starts the process to find the total price	1	K	$27 \times '11.5' (=310.50)$ OR $2 \times 33 (=66)$ OR $96 + 78 (=174)$
	A4	Full process to find the total price	2 or	KL	$(27 \times 11.5) + 96 + (2 \times 33) + 78 (=550.5)$ oe Allow one error or omission
	I6	Correct answer in correct money notation	3	KLM	£550.50 in correct money notation
	A5	Valid check	1	N	Valid check, e.g. reverse calculation
Total marks for question			4		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R2	Starts the process to work with fraction	1 or	P	e.g. $6 + 1 (=7)$ and $20 + 14 + 22 (=56)$ OR $1 \div 8 \times (20 + 14 + 22) (=7)$
	A4	Full process to find figures to compare	2 or	PQ	$\frac{17}{156}$ OR e.g. $'7' \div '56' (=0.125)$ and $1 \div 8 (=0.125)$ OR $1 \div 8 \times '56' (=7)$ and $6 + 1 (=7)$ OR $'56' \div '7' (=8)$
	I7	Valid decision with accurate figures	3	PQR	Decision (e.g. Yes) AND correct figures allowing comparison
Total marks for question			4		

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Section C: Diving

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(a)	R3	Calculates with or converts time	1 or	A	e.g. $(5 + 3) \times 4 (=32)$ oe OR $9:15 - 4:30 (=4 \text{ h } 45 \text{ min})$ oe OR $4:30 + 25(=4:55)$ OR 45 or 90 seen
	A4	Begins the process to find total time	2 or	AB	Adds at least 4 of: '32', '45', '90', 25, 40, 30 OR Adds at least 3 of '32', '45', '90', 25, 40, 30 to 4:30 oe OR Subtracts at least 3 of '32', '45', '90', 25, 40, 30 from 9:15 oe May be shown in a time plan
	A4	Full process to find figures to compare	3 or	ABC	$4:30 + '32' + '45' + '90' + 25 + 40 + 30 (=8:52)$ oe OR $9:15 - '32' - '45' - '90' - 25 - 40 - 30 (=4:53)$ oe OR Full build up method or time plan e.g. 4:30, 5:02, 5:47, 7:17, 7:42, 8:12, 8:52 OR $'32' + '45' + '90' + 25 + 40 + 30 (=4 \text{ h } 22 \text{ min or } 262 \text{ min})$ AND $9:15 - 4:30 (=4 \text{ h } 45 \text{ min or } 285 \text{ min})$ Allow one error or omission
	I7	Correct conclusion with accurate figures	4	ABCD	Yes AND 8:52 (pm) oe OR Yes AND 4:53 (pm) oe OR Yes AND 4h 22min and 4h 45 min OR 262 (min) and 285 (min)

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Q8(b)	R1	Begins working with proportion	1 or	E	e.g. $529 \div 30 (=17.63..)$ OR $700 \div 40(=17.5)$ OR $40 \div 30 (= 1.33..)$ or $30 \div 40 (0.75)$
	A4	Full process to find figures to compare	2 or	EF	e.g. $529 \div 30 \times 40 (=705.33..)$ oe OR $700 \div 40 \times 30 (=525)$ oe OR $529 \div 30 (=17.63..)$ and $700 \div 40(=17.5)$
	I7	Correct conclusion with accurate figures	3	EFG	Yes AND $705(.33..)$ (kcal) OR Yes AND 525 (kcal used in 30 min if 700 kcal in 40 min) OR Yes AND $17.6(3..)$ and 17.5 (kcal/minute)
	A5	Valid check	1	H	Valid check, e.g. reverse calculation or alternative method
Total marks for question			8		

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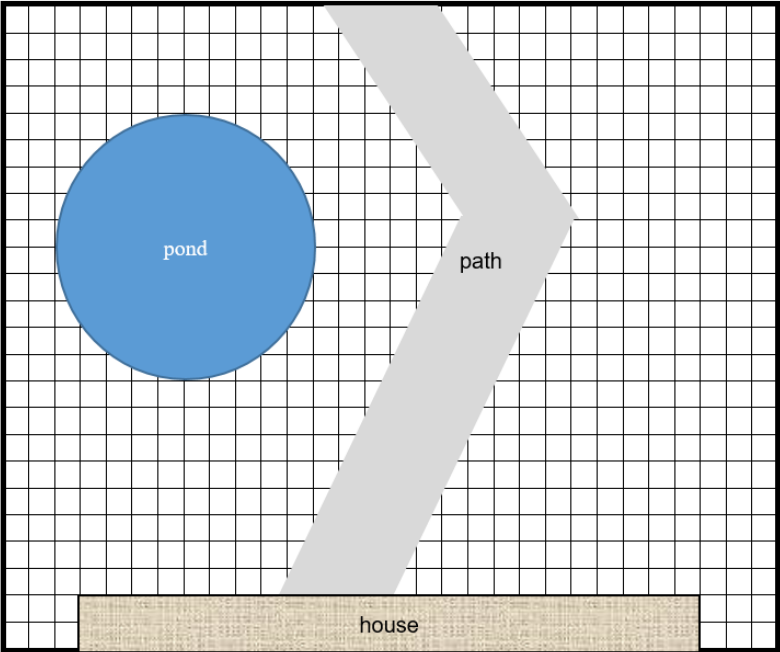
Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9(a)	R2	Works with mean or difference	1 or	J	$(498.5 + 514 + 521.5 + 519) \div 4 (=513.25)$ OR $(508 + 517.5 + 518 + 522) \div 4 (=516.375)$ OR $508 - 498.5 (=9.5)$ and $517.5 - 514 (=3.5)$ and $518 - 521.5 (= - 3.5)$ and $522 - 519 (=3)$ OR $498.5 + 514 + 521.5 + 519 (=2053)$ and $508 + 517.5 + 518 + 522 (=2065.5)$ OR $3.2 \times 4 (=12.8)$
	A4	Full process to find figures to compare	2 or	JK	e.g. $'516.375' - '513.25' (=3.125)$ OR $('9.5' + '3.5' - '3.5' + '3') \div 4 (=3.125)$ OR $('2065.5' - '2053') \div 4 (=3.125)$ OR $3.2 + '513.25' (=516.45)$ OR $'516.375' - 3.2 (=513.175)$ OR $'9.5' + '3.5' - '3.5' + '3' (=12.5)$ and $3.2 \times 4 (=12.8)$
	I7	Valid decision with accurate figures	3	JKL	e.g. No and 3.125 OR No and 516.45 and 516.375 OR No and 513.25 and 513.175 OR No and 12.5 and 12.8

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Q9(b)	I6	Identifies middle figures	1	M	7.5, 7, 7.5
	R2	Begins to work with the formula	1 or	N	'7.5' + '7' + '7.5' (=22) Condone addition of any 3 values from the table
	A4	Substitutes into the formula	2	NP	'22' × 3.4 (=74.8) OR (501.7 – 428.9) ÷ 3.4 (=21.41..)
	R3	Develops solution	1 or	Q	428.9 + '74.8' (=503.7) OR 501.7 – '74.8' (=426.9) OR 501.7 – 428.9 (=72.8)
	I7	Valid decision with accurate figures	2	QR	Yes AND 503.7 OR Yes AND 426.9 OR Yes AND 74.8 and 72.8 OR Yes AND 21.41 and 22
Total marks for question			8		

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Example of fully correct answer for Q5a



Ofqual



Llywodraeth Cymru
Welsh Assembly Government



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