

Mark Scheme (Results)

July 2018

Functional Skills Mathematics Level 2

FSM02

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FUNCTIONAL SKILLS (MATHEMATICS) MARK SCHEME – LEVEL 2 JULY 2018

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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: Railway

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R1	Full process to find mean	1 or	A	$(29500 + 28700 + 23100 + 21800 + 29400 + 20700 + 13400) \div 7 (=23800)$
	I6	Correct answer	2	AB	23800
	A5	Valid check	1	C	Valid check, e.g. reverse calculations or estimation
Q1(b)	R3	Works with totals	1 or	D	$287 + 54 + 17 + 5 (=363)$ OR $287 + 54 (=341)$ OR $17 + 5 (=22)$ OR $100 - 98 (=2)$
	A4	Full process to find figures to compare	2 or	DE	$'341' \div '363' \times 100 (=93.93..)$ OR $'22' \div '363' \times 100 (=6.06..)$ and $100 - 98 (=2)$ OR $0.98 \times '363' (=355.74)$ and $287 + 54 (=341)$ OR $'0.02' \times '363' (=7.26)$ oe Condone $54 \div '363' \times 100(=14.87..)$
	I7	Valid conclusion with accurate figures	3	DEF	No AND $93(.93..)(\%)$ OR No AND $6(.06..)$ (and $2 (\%)$) OR No AND $355(.74)$ and 341 OR No AND $7(.26)$ (trains)
Total marks for question			6		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R1	Uses consistent units	1	G	e.g. 0.8 (m), 0.7(m), 1 000 000(cm ³) oe may be seen or implied in subsequent working
	A4	Process to find volume of one container or volume of stones needed	1 or	H	'0.8' × '0.8' × '0.7' (=0.448) oe OR 60 ÷ 1.8 (=33.33..)
	A4	Develops solution	2 or	HJ	'0.448' × 1.8 (=0.8064) OR '0.8' × '0.8' × '0.7' (=0.448) oe and 60 ÷ 1.8 (=33.33..)
	R2	Full process to find the total number of containers needed	3	HJK	60 ÷ '0.8064' (=74.40..) OR '33.33..' ÷ '0.448' (=74.40..) OR
	I6	Full process to find the total cost	1 or	L	'75' × 45.16 (=3387)
	I6	Accurate figure	2	LM	(£)3387
Total marks for question			6		

**FUNCTIONAL SKILLS (MATHEMATICS)
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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R1	Begins to work with time	1	N	13:28 – 11:20 (=2hr 8min) oe
	R3	Process to work with compound measure or process to convert time	1 or	P	e.g. $210 \div '2\text{hr } 8\text{min}'$ OR $210 \div 104 (=2.01..)$ OR $'128' \div 60 (=2.13..)$ oe
	A4	Full process to find figures to allow comparison	2 or	PQ	e.g. $210 \div '128' \div 60' (=98.43..)$ OR $'128' \div 60 (=2.13..)$ oe and $210 \div 104 (=2.01..)$ oe OR $'2.01..' \times 60 (=121.15..)$ oe OR $'2.13..' \times 104 (=221.8..)$
	I7	Valid decision with accurate figures	3	PQR	e.g. No AND 98(.43..) (mph) OR No AND 2.1(3..) (hours) and 2.0(1..) (hours) oe OR No AND 128 and 121(.15..) (mins) OR No AND 2(hr) 8 (min) and 2 (hour) 1(.14..) (minutes) OR No AND 221(.8..) (miles)
Total marks for question			4		

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Section B: Electrical company

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	R1	Begins to work with formula	1 or	A	13^2 (=169) oe OR $2 \times 13 \times 34$ (=884)
	A4	Full process to find figures to compare	2 or	AB	$13 \times 13 + 2 \times 13 \times 34$ (=1053) OR 13^2 (=169) and $1000 - '884'$ (=116) OR $2 \times 13 \times 34$ (=884) and $1000 - '169'$ (=831)
	I7	Valid decision with accurate figures	3	ABC	No AND 1053 (cm ²) OR No AND 169 (cm ²) and 116 (cm ²) OR No AND 884 (cm ²) and 831 (cm ²)
Q4(b)	R2	Begins to work with ratio	1 or	D	e.g. $9 + 3 + 15$ (=27) OR $30 \div 3$ (=10) OR 90 or 150 OR 3:1:5
	R3	Develops solution	2 or	DE	e.g. $9 + 3 + 15$ (=27) and $30 \div 3$ (=10) OR 90 and 150 OR $3 + 1 + 5$ (=9)
	A4	Full process to find total amount of dye	3 or	DEF	e.g. $'27' \times '10'$ (=270) oe OR $'90' + 30 + '150'$ (=270) OR $'9' \times 30$ (=270)
	I6	Correct answer	4	DEFG	270
	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
Q5	R2	Full process to find median	1	J	$(29.60 + 33.80) \div 2 (=31.7)$
	A4	Begins to work with fraction	1 or	K	'31.7' $\div 4 (=7.925)$ OR '31.7' $\times 5 (=158.5)$ OR $5 \div 4 (=1.25)$
	A4	Full process to work with fraction	2 or	KL	'31.7' $\times 5 \div 4 (=39.625)$ oe
	I6	Accurate figure	3	KLM	(£)39.60 OR (£)39.62 OR (£)39.63 OR (£)39.65
Total marks for question			4		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	I7	Reads a value off a graph	1	N	[580, 600]
	R2	Full process to find the total income	1 or	P	'[550,630]' \times 14.5(= [7975, 9135]) OR '[550,630]' \times 15(= [8250, 9450])
	I6	Accurate figure	2	PQ	e.g. (£) [7975, 9135] OR (£) [8250, 9450]
Q6(b)	A5	Makes a valid comment	1	R	A valid comment, e.g. (Suitable because) trend line goes up (Not suitable) as sales have started to go down (Not suitable) as less lamps used in Summer
Total marks for question			4		

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Section C: Organising a run

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R1	Uses consistent units	1	A	e.g. 6.42, 0.33, 0.22, 1.26, 0.92, 0.43, 0.97, 0.85, 0.52, 0.79, 0.17, 0.35 May be seen or implied in subsequent calculations
	A4	Converts between imperial and metric	1	B	e.g. $4 \div 5 \times 8 (=6.4)$ oe OR '6.42' $\times 5 \div 8 (=4.0125)$
	I6	Begins to choose a route	1 or	C	Selects a route with 2 of: starts and ends at the meeting point goes around the lake goes through point A has a total length between 4 and 4.5 miles (6.4 and 7.2 km) NB may be implied by their calculations
	I7	Selects correct route	2	CD	Selects a route with all of: starts and ends at the meeting point goes around the lake goes through point A has a total length between 4 and 4.5 miles (6.4 and 7.2 km) e.g. M-F-E-D-C-G-C-B-A-M NB may be implied by their calculations
	A4	Full process to find the total length of the route	1 or	E	e.g. $330 + 1260 + 920 + 430 + 970 + 850 + 520 + 790 + 350 (=6420)$ Total for their route provided C awarded
	I6	Accurate total for the length of a correct route	2	EF	e.g. 6420 m oe (units required) If final distance is from correct route within range award A & B
Total marks for question			6		

**FUNCTIONAL SKILLS (MATHEMATICS)
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Question	Skills	Process	Mark	Mark Grid	Evidence
Q8	R1	Process to work with area or scale factor	1 or	G	e.g. $105 \times 148 (=15540)$ OR $0.8 \times 0.8 (=0.64)$ OR $105 \times 0.8 (=84)$ OR $148 \times 0.8 (=118.4)$
	A4	Full process to find the area	2 or	GH	e.g. '15540' \times '0.64' (=9945.6) OR '118.4' \times '84' (=9945.6)
	I6	Accurate figure	3	GHJ	9945(.6) (mm ²)
Total marks for question			3		

**FUNCTIONAL SKILLS (MATHEMATICS)
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Question	Skills	Process	Mark	Mark Grid	Evidence
Q9(a)	R2	Begins to work with cost or percentage	1 or	K	e.g. $4.79 + 2.90 (=7.69)$ OR $4.79 \times 0.15(=0.7185)$ OR $2.90 \times 0.15(=0.435)$ OR $130 \times 0.15 (=19.5)$ OR $(100 - 15) \div 100 (=0.85)$
	A4	Develops solution	2 or	KL	e.g. $130 \times '7.69' \times 0.15 (=149.955)$ OR $130 \times '7.69' (=999.7)$ OR $'7.69' \times '0.85' (6.53..)$ OR $4.79 \times '0.85' (=4.0715)$ OR $2.90 \times '0.85' (=2.465)$ OR $130 \times '0.85' (=110.5)$
	A4	Full process to find the total discounted cost	3 or	KLM	e.g. $'0.85' \times '999.7' (=849.745)$ oe OR $'999.7' - '149.955' (=849.745)$ oe OR $'6.53..' \times 130 (849.745)$
	I7	Correct answer in correct money notation	4	KLMN	£849.74 or £849.75 in correct money notation

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9(b)	R2	Begins to design data collection sheet	1 or	P	Input opportunities AND at least 2 of overall headings (may be implied by two sets of subheadings): gender age how did you hear oe
	R3	Improves data collection sheet	2 or	PQ	Input opportunities AND headings for all of subheadings: male/female 16-30, 30+ newspaper, internet, friends may not be efficient – allow questionnaire
	I6	Efficient data collection sheet	3	PQR	Fully correct and efficient summary sheet
Total marks for question			7		

Example of fully correct answer to Q9b

	(gender)	M(ale)		F(emale)	
	(age)	16 - 30	30+	16 - 30	30+
(how did you hear about it)	N(ewspaper)				
	I(nternet)				
	F(riends)				

Ofqual



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



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