

Mark Scheme (Results)

March 2013

Functional Skills Mathematics
Level 2 (FSM02)

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Guidance for Marking Functional Mathematics 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 marks should be awarded for the 'best' answer.
- 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 their answer. You are less likely to see instances of this in functional mathematics.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the demand of the functional 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, mark the better answer.
- **Follow through marks** 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 indicate that the units do not have to be stated for the mark to be awarded.
 - **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
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 **o.e.** 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
 - (12.5,105) is the exclusive open interval
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in later parts of a question, even if not explicit in the expected part.
- Discuss any queries with your Team Leader

Graphs

The mark schemes for most graph questions have this structure:

Process		Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph,)	1	1 of
	or	linear scale(s), labels, plotting (2mm tolerance)
	2	2 of
	or	linear scale(s), labels, plotting (2mm tolerance)
	3	all of
		linear scale(s), labels, plotting (2mm 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**, whether or not it is broken, whether or not 0 is shown, whether or not the scale is shown as broken. Thus a graph that is 'fit for purpose' in that 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. Award the mark for plotting if you can read the values clearly, even if the scale itself is not linear.

The mark schemes for **Data Collection 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.

Section A: Castle Abbey

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Selects correct information from table	1	A	10 (am) - 5.30 (pm)
Q1b	R2	Process to find number of groups	1 or	B	Process to divide children into groups ≤ 10
	A4	Considers allocating adults to groups	2	BC	Each group of children ≤ 10 AND Allocates at least one adult to each group AND all children allocated
	I6	Considers adult carers	1 or	D	All group sizes ≤ 12 AND allocates two children their own carer (allow use of only 1 carer)
	A5	Fully correct answer	2	DE	5 groups with groups sizes ≤ 12 and at least one adult per group of up to 10 children given or implied. All children allocated. Allow 2 children with own carers as separate group(s)
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2a	R1	Begins to schedule activities	1 or	F	Produces a complete plan for one group (allow one error in timing) OR Shows a plan for 3 floors and 3 groups OR Plan for 3 groups without floor allocations but with correct timing for lunch and practical activity
	I7	Begins to produce time plan	2 or	FG	Produces a correct plan for one group (finish time may be implicit) OR For all 3 groups, allows at least 60minutes for floors and 2 of: starts at 11:00 or later, 30 minutes for the activity, lunch break of 45 minutes, finishes by 14:30
	A5	Develops time plan	3 or	FGH	Produces a correct plan for two groups OR For all 3 groups: start at 11:00 or later, allows at least 60minutes for floors, 30 minutes for the activity, lunch break of 45 minutes, AND 1 of: finishes by 14:30, only one group on a floor at the same time, 20 minutes on each floor
	I7	Complete efficient time plan with all constraints checked	4	FGHJ	Complete and correct ordered time plan with start times and finish before 14:30 and clearly showing only one group on each floor at the same time Time in garden and finish time may be implicit throughout. Time schedule does not need to be continuous.

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2b	R2	Process to find spice bags per year or teaspoons used per day or teaspoons per 2 kg or grams per teaspoon	1 or	K	$84 \times 20 (=1680 \text{ bags per year})$ OR $20 \text{ (bags per day)} \times \frac{1}{4} (= 5 \text{ tsp per day})$ OR $'2000' \div 3 (=666.6.. \text{ tsp in 2kg})$ OR $3 \div 4 (= 0.75 \text{ g per tsp})$
	R3	Process to find teaspoons per year or grams per day or number of bags available	2 or	KL	$'1680' \times \frac{1}{4} (=420)$ OR $'5' \times 84 (=420)(\text{tsp per year})$ OR $'5' \times 3(=15)(\text{g per day})$ $'666.6..' \div \frac{1}{4} (= 2666.6..)$ (bags in 2 kg) OR $'0.75 \times 20' (=15 \text{ g per day})$
	A4	Full process for figures to compare	3	KLM	$'420' \times 3(=1260)(\text{g})$ OR $'15' \times 84(=1260)(\text{g})$ OR $'2666.6' \div 84 (=31.74..)$ (bags per day) OR $'2666.6' \div 20 (133.3..)$ (days per year) OR $'666.6..' \div \frac{1}{4} (= 2666.6..)$ (bags in 2 kg) and $84 \times 20(=1680 \text{ bags per year})$ OR $'2000' \div 3(=666.6.. \text{ tsp in 2kg})$ AND $'5' \times 84 (=420)(\text{tsp per year})$
	A4	Uses consistent units	1 or	N	2000 (g) seen or 0.003 (kg) seen or multiplies or divides relevant quantity by 1000
	I6	Valid decision from correct figures	2	NP	E.g. Yes AND 1260 (g) or 1.26 (kg) OR Yes AND 31 (bags or children per day) OR Yes AND 133 (days per year) OR Yes AND 2666 bags and 1680 bags o.e Yes AND 420 (tsp per year) and 666.6...(tsp in 2 kg)
Total marks for question			9		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	A4	Works with pie chart	1	Q	Full process to find 8% of 7275 (=582) by any method OR Measures angle [27°,31°] AND finds [27°,31°]÷360 of 7275 (=[525, 607])
	I7	Makes correct decision from their answer	1	R	e.g '582' < 612 OR [525, 607] < 612
Total marks for question			2		

Section B: Theatre

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R2	Uses formula	1 or	A	$(0.3 \times 100) \div 8$ OR $0.3 \times 100 \div 4$ OR $8 \times 4 \div 100$
	A4	Finds figures to compare	2	AB	3.75 OR 7.5 OR 0.32
	I7	Decision ft. their answer provided mark A is awarded	1	C	Yes and 3.75 (ramp length minimum) OR Yes and 7.5(%) OR Yes and 0.32 (step height maximum)
Total marks for question			3		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5a	R1	Draws net of cuboid with or without a base	1 or	D	5 or 6 correctly connected rectangles – dimensions not required
	I6	Complete correct net	2	DE	Fully correct net with 5 or 6 faces (ignore any flaps) with sufficient dimensions labelled
Q5b	A4	Works with scale	1 or	F	Rectangle, with 1 of 1 sq by 1.5 sq exactly 3 sq from front at least 2 sq from every exit
	R2	Starts to position shape	2 or	FG	Rectangle, with 2 of 1 sq by 1.5 sq exactly 3 sq from front at least 2 sq from every exit
	I6	Completes correct shape in correct position to meet requirements	3	FGH	Rectangle 1 sq by 1.5 sq, exactly 3 sq from front at least 2 sq from every exit
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6a	R1	Starts to work with costs	1 or	J	Two of: $2 \times 12.50 (=25)$ OR $3 \times 11 (=33)$ OR $6 \times 9.5 (=57)$ OR $2 + 3 + 6 (=11)$ OR $12.5 - 10.5 (=2)$ OR $11 - 10.5 (=0.5)$ OR $9.5 - 10.5 (= -1)$ OR $10 \times 10.5 (=105)$
	A4	Process for total cost or difference	2 or	JK	e.g. $'25' + '33' + '57' (=115)$ OR $'11' \times 10.5 (=115.5)$ OR $2 \times '2'$ and $3 \times '0.5'$ and $6 \times '-1'$ $(=-0.5)$ OR $'105' + 9.5 (=114.5)$
	I6	Finds costs to compare with £2.50	3	JKL	e.g. $'115' - '115.5' (= -0.5)$ OR $2 \times '2' + 3 \times '0.5' + 6 \times '-1'$ $(=-0.5)$ OR $'115' \div '11' (=10.45..)$ and $('10.45' - 10.50) \times '11'$ $(= -0.55)$ OR $115 - 114.5 (=0.5)$ OR $'115'$ AND $'115.5'$ or $'114.5'$ with comment on comparison
	I7	Correct decision and accurate figures	1	M	No AND 115 AND 115.5 or 114.5
	A5	Show a checking calculation	1	N	Reverse calculation or different method

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6b	R2	Process to find total time	1 or	P	30 + 135 + 20 (=185) OR Starts to add on from 2.00 pm OR Converts 135 to 2 (hours) 15 (minutes) (may be implicit in following calculations) OR 155 or 2 (hours) 35 (minutes)
	A4	Finds lapsed time	2	PQ	185 (minutes) OR 3 (hours) 5 (minutes) OR 5:05 OR 2 (hours) 35 (minutes) AND (£)1.80
	I6	Correct answer	1	R	(£)2.70 OR 3 to 4 hours
Total marks for question			8		

Section C: Football

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R1	Starts to work with costs	1 or	A	e.g. $50 \div 11 (=4.54)$ OR $45 \div 11 (=4.09)$ OR $50 \times '18' (=900)$ OR $45 \times '20' (=900)$ OR $'20' \times 4.5 \times 11 (=990)$ OR $'18' \times 1.5 \times 11 (=297)$ (Allow 4 home and 2 away games)
	R3	Starts to process total costs or cost per player	2 or	AB	e.g. $50 + 11 \times 1.5 (=66.5)$ OR $45 + 11 \times 4.5 (=94.5)$ OR $'20' \times '8.59' \times 11 (1890)$ OR $'18' \times '6.04' \times 11 (1197)$ OR $'4.09' + 4.5 (=8.59)$ OR $'4.54' + 1.5 (=6.05)$ OR $50 \times '18' (=900)$ AND $'18' \times 1.5 \times 11 (=297)$ OR $45 \times '20' (=900)$ AND $'20' \times 4.5 \times 11 (=990)$ (Allow 4 home and 2 away games)
	A4	Process for total cost of home or away games or cost per player for home and away games	3 or	ABC	e.g. $'66.5' \times '18' (=1197)$ OR $'94.5' \times '20' (=1890)$ OR $'8.59' + '6.04' (=14.63)$ OR $'900' + '297' (=1197)$ OR $'900' + '990' (=1890)$
	A4	Process for cost per week or per player	4	ABCD	e.g. $('1197' + '1890') \div 11 (=280.63\dots)$ OR $('1197' + '1890') \div '38' (=81.23\dots)$ OR $'14.63' \div 2 (=7.31\dots)$
	I6	Finds cost per week per player	1	E	£7.38 or £7.39 or £7.40 or £7.50 OR £7.31 or £7.32 or £7.40 Correct money notation
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8a	I7	Makes valid comment interpreting the data	1	F	e.g. Su's team had fewer goals for Su's team had fewer goals against Su's team had good defence Su's team are better at defence than attack
Q8b	R2	Begins to develop appropriate graph	1 or	G	1 of Linear scale, plotting (goals for and against), labels
	A4	Improves graph	2 or	GH	2 of Linear scale, plotting (goals for and against), labels
	I6	Completes graph	3	GHJ	3 of Linear scale, plotting (goals for and against), labels Minimum labels required: Averages in axis label with goals in key or title, goals, (may be in axis label or key or title), for, against, names of teams

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8c	R3	Starts to work with averages	1 or	K	$11 + 10 + 8 + 8 + 20 + 16(=73)$ OR $12 + 11 + 10 + 8 + 8 + 20 + 16(=85)$ OR 8, 8, 10, 11, 16, 20 OR 8, 8, 10, 11, 12, 16, 20 OR Mode is 8
	A4	Completes process for one average	2	KL	$'73' \div 6 (= 12.1\dots)$ OR $'85' \div 7 (=12.1\dots)$ OR $(11 + 10) \div 2 (= 10.5)$ OR 11
	A4	Finds correct mean and correct median	1	KLM	12.1.. AND 10.5 OR 12.1.. AND 11 including Su's goals
	I7	Makes a valid decision with explanation. Allow ft Mark L must be scored and mean and median found	1	N	Correct ft decision based on calculated averages with explanation e.g. median 10.5 as Su has scored more goals than the median OR mode as it is only 8 L must be scored and two averages found
Total marks for question			8		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R1	Process to find area or use consistent units (N.B. correct conversion is $10\,000\text{ m}^2 = 1\text{ hectare}$)	1 or	P	$90 \times 45.5 (=4095\text{ (m}^2))$ OR $5 \times 10000 (=50000\text{ (m}^2))$ OR (using given conversion) $5 \times 1000 (=5000\text{ (m}^2))$
	A4	Process to find area and use consistent units	2 or	PQ	$90 \times 45.5 (=4095\text{ (m}^2))$ AND $5 \times 10000 (=50000\text{ (m}^2))$ OR $90 \times 45.5 \div 10000 (=0.4095\text{ (hectares)})$ OR (using given conversion) $90 \times 45.5 (=4095\text{ (m}^2))$ AND $5 \times 1000 (=5000\text{ (m}^2))$ OR $90 \times 45.5 \div 1000 (=4.095\text{ (hectares)})$
	I7	Valid decision with accurate figures	3	PQR	Yes AND $50000\text{ (m}^2)$ AND $4095\text{ (m}^2)$ OR Yes AND $0.4(095)\text{ hectares}$ OR (using given conversion) Yes AND $5000\text{ (m}^2)$ AND $4095\text{ (m}^2)$ OR Yes AND $4(.095)\text{ hectares}$
Total marks for question			3		

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