

Mark Scheme (Results)

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

Appropriate graph or chart –
(e.g. bar, stick, line graph,)

1
or

Evidence

1 of
linear scale(s), labels, plotting (2mm
tolerance)

2
or

2 of
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: The restaurant

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Begins to consider constraints	1 or	A	5 of: Adit 4 hours Bir 7 hours Deva 6 hours Edi 5 hours Jan 7 hours 3 staff from 1100 to 1500 3 staff from 1800 to 2300 2 staff from 2300 to 2400
	I6	Improves solution	2 or	AB	7 of: Adit 4 hours Bir 7 hours Deva 6 hours Edi 5 hours Jan 7 hours 3 staff from 1100 to 1500 3 staff from 1800 to 2300 2 staff from 2300 to 2400

	A5	Fully correct solution	3	ABC	All 10 of: Adit 4 hours Bir 7 hours Deva 6 hours Edi 5 hours Jan 7 hours 3 staff from 1100 to 1500 3 staff from 1800 to 2300 2 staff from 2300 to 2400 Deva shift split in exactly 2 parts No fragmentation
Q1b	R2	Full process to find figures to compare	1 or	D	$6.34 \times 20 \times 52 (=6593.6)$ OR $7000 \div 6.34 (= 1104.1\dots)$ and $20 \times 52 (=1040)$ OR $6.34 \times 20 (=126.8)$ and $7000 \div 52 (=134.6\dots)$ OR $7000 \div 52 \div 20 (=6.73\dots)$ OR $7000 \div 6.34 \div 20 (=55.2\dots)$ Condone use of 48 weeks a year for this mark
	A4	Finds accurate figures	2	DE	(£)6593.6 or [6552, 6604] (per year) OR 1040 and [1104,1105](hours) OR (£)[126,127] and (£)[134,135] (pay per week) OR (£)6.73...per hour OR 55 (weeks) Do not condone use of 48 for this mark
	I7	Valid ft. conclusion provided mark D has been awarded.	1	F	Ft. conclusion provided mark D has been awarded E.g. Yes
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R2	Process to find total kg of rice needed for 4 weeks or bags for 1 week or cost per kg	1 or	G	$4 \times [98,112]$ ($=[392,448]$) OR $[98, 112] \div 20$ ($=[4.9, 6]$) OR $[98, 112] \div 25$ ($=[3.9, 5]$) OR $31.99 \div 20$ ($=1.59..$) OR $43.95 \div 25$ ($=1.758$)
	A4	Process to find the number of bags needed for at least one size of bag for 4 weeks or works with cost per kg over 4 weeks	2	GH	$'[392,448]' \div 20$ ($=[19.6,22.4]$) OR $'[392,448]' \div 25$ ($=[15.68,17.92]$) OR $'[4.9, 6]' \times 4$ ($=[19.6, 24]$) OR $'[3.9, 5]' \times 4$ ($=[15.6, 20]$) OR $31.99 \div 20$ ($=1.59..$) and $4 \times [98,112]$ ($=[392,448]$) OR $43.95 \div 25$ ($=1.758$) and $4 \times [98,112]$ ($=[392,448]$)
	I6	Finds number of bags needed for at least one size of bag for 4 weeks or 1 week	1	J	Needs 20, 21, 22, 23,24 (of the 20 kg bags) OR Needs 16, 17, 18,19,20 (of the 25 kg bags) OR Needs 5 or 6 (of the 20 kg bags) OR Needs 4 or 5 (of the 25 kg bags)
	A4	Process to find costs to compare	1	K	$'[20, 24]' \times 31.99$ ($=[639.8, 767.76]$) and $'[16, 20]' \times 43.95$ ($=[703.2, 879]$) OR $'[5,6]' \times 31.99$ ($=[159.95,191.94]$) and $'[4,5]' \times 43.95$ ($=[175.8,219.75]$) OR $'1.59' \times [392,448]$ and $'1.758' \times [392,448]$ OR $'1.59' \times [98,112]$ and $'1.758' \times [98,112]$ Accept Calculating with (£)32 and (£)44 as good estimation

	I6	Valid decision and accurate figures	1	L	Sharma wholesalers and £639.80 or £640 (20 bags) OR Sharma wholesalers and £671.79 or £672 (21 bags) OR Sharma wholesalers and £703.78 or £704 (22 bags) OR Sharma wholesalers and £735.77 or £736 (23 bags) OR Sharma wholesalers and £767.76 or £768 (24 bags) Correct money notation
	A5	Shows a suitable check	1	M	Shows a reverse check for any part of the process, an alternate method or a good approximation method
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3a	I7	Makes at least one valid statement	1 or	N	See statements listed below
	I7	Makes 2 valid statements at least one of which must be between columns	2	NP	Statements include Down a column The profit from take away meals increases each year Sit in meals had their highest profit in 2011 Between columns More profit is made from sit in meals than from take away meals The year with the highest total profit was 2012 The year with the lowest total profit was 2010
Q3b	R2	Chooses at least 1 correct display	1 or	Q	Ticks at least 1 of: A or E or F AND no more than 1 of: B or C or D
	R3	Chooses all correct displays	2	QR	Ticks A and E and F and no others
Total marks for question			4		

Section B: The dining room

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	A4	Uses consistent units	1	A	3600 (mm) or 4800 (mm) or 1.2 (m) or 0.2 (m) Or consistent use of cm
	R2	Process to find number of pieces along a length or works with area	1 or	B	'3600'÷1200(=3) OR '4800'÷200(=24) OR '3600' ÷200(=18) OR '4800'÷1200(=4) OR $3.6 \times 4.8(=17.28)$ OR '1.2'× '0.2'(=0.24)
	A4	Process to calculate total number of pieces needed or the area one pack of the laminate available would cover or total area the laminate available would cover	2	BC	'3'× '24'(=72) OR $4 \times 18(=72)$ from pieces laid in different orientation '17.28'÷'0.24'(=72) OR '0.24' × 8 (=1.92) OR '0.24' × 10 × 8 (=19.2)
	I6	Process to calculate number of packs needed or number of pieces available	1 or	D	'72'÷ 8(=9) OR $10 \times 8(=80)$ OR '17.28' ÷ '1.92' (=9) Note that 10×8 may be embedded in '0.24' × 10 × 8 (=19.2)
	I7	Valid decision and accurate figures	2	DE	Yes and 9 (packs needed) OR Yes and 72 and 80 (pieces) OR Yes and 17.28 (m ²) and 19.2 (m ²) OR Yes and 17280000 (mm ²) and 19200000 (mm ²)
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5a	R1	Substitutes into formula	1 or	F	$25 \times 4.8 \times 3.6 (=432)$
	A4	Finds watts needed	2	FG	432 (watts)
	R1	Process to find number of lights needed	1or	H	'432' \div 180(=2.4)
	I7	Interprets working and states correct number of lights	2	HJ	3 (lights needed) Allow 2 lights, but only if rounded from 2.4
Q5b	R2	Process to find difference in cost or uses percentage	1 or	K	$699 - 249 (=450)$ or $700 - 250 (=450)$ OR $0.7 \times 699 (=489.3)$ or $0.7 \times 700 (=490)$ rounding
	A4	Process to find figures to compare	2 or	KL	$699 - 249 (=450)$ and $0.7 \times 699 (=489.3)$ OR $699 - '489.3' (=209.7)$ OR $700 - '490' (=210)$ OR $0.3 \times 699 (=209.7)$ or $0.3 \times 700 (=210)$ rounding OR '450' \div 699(=0.64...)
	I7	Valid decision and accurate figures	3	KLM	Yes and (£)450 and (£)489.3 OR Yes and (£)209.7 or (£)210 from rounding OR Yes and 64(%)
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R3	Process to find quantity of any ingredient per person, or uses scale factor	1 or	N	$250 \div 4 (=62.5)$ or $8 \div 4 (=2)$ OR $600 \div 10 (=60)$ or $22 \div 10 (=2.2)$ OR $10 \div 4 (=2.5)$ o.e eg $4 + 4 + 4 \div 2 (=10)$ OR $600 \div 250 (=2.4)$ or $22 \div 8 (=2.75)$
	A4	Process to compare quantities for 1 ingredient	2 or	NP	$'62.5' \times 10 (=625)$ oe or $'2' \times 10 (=20)$ OR $10 \div 4 (=2.5)$ and $600 \div 250 (=2.4)$ OR $10 \div 4 (=2.5)$ and $22 \div 8 (=2.75)$ OR $250 \div 4 (=62.5)$ and $600 \div 10 (=60)$ OR $8 \div 4 (=2)$ and $22 \div 10 (=2.2)$ OR $22 \div '2' (=11)$ OR $600 \div 62.5 (=9.6)$
	A4	Full process to compare quantities for both ingredients	3 or	NPQ	$'62.5' \times 10 (=625)$ and $'2' \times 10 (=20)$ OR $10 \div 4 (=2.5)$ and $600 \div 250 (=2.4)$ and $22 \div 8 (=2.75)$ OR $250 \div 4 (=62.5)$ and $600 \div 10 (=60)$ and $8 \div 4 (=2)$ and $22 \div 10 (=2.2)$ OR $22 \div '2' (=11)$ and $600 \div 62.5 (=9.6)$
	I7	Valid decision and accurate figures for both ingredients	4	NPQ R	Valid decision AND 625 and 20 OR 2.5 and 2.4 and 2.75 OR 62.5 and 60 and 2 and 2.2 OR Enough tomatoes for 11 (people) and enough lentils for 9.6 (people)
Total marks for question			4		

Section C: Tote bags

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R3	Process to convert between units	1 or	A	148 ÷ 2.54 (=58.2..) OR 14 × 2.54 (=35.56)
	A4	Process to find number across the width	2	AB	'58.2..' ÷ 14 (=4.16..) OR 148 ÷ '35.56' (=4.16..)
	I6	Finds correct number of widths	1	C	4 Condone use of 2.5 for '2.54' for full marks
	A5	Reverse calculates or uses a different method to check	1	D	E.g. 4 × 14(=56) OR 4 × 35.56 (=142.24) OR Uses different method
Total marks for question			4		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8a	R2	Process to find total sales required or sales total so far or to find differences	1 or	E	$4 \times 14500 (=58000)$ OR $13800 + 14200 + 14900 (=42900)$ OR $\pm 700, \pm 300, \pm 400$
	A4	Full process for last quarter sales or uses difference	2 or	EF	'58000' - '42900' (=15100) OR '58000' - 13800 - 14200 - 14900 (=15100) OR Needs to be 600 over
	I6	Finds correct answer	3	EFG	(£)15100
Q8b	A4	Converts fraction of an hour to minutes	1	H	3 hours 15 minutes seen or used
	R1	Process for total time to press and pack or total available time	1	J	$8 \times 10 (=80 \text{ minutes})$ o.e. seen or used OR 5 hours 50 minutes (available)
	R2	Complete process to add time needed or to time plan forwards or backwards	1 or	K	3 hours 15 minutes + 20 minutes + 1 hour 20 minutes + 45 minutes (=5 hours 40 minutes) o.e. OR e.g. 9.40, 12.55, 1.15, 2.00, 3.20 OR e.g. 15.30, 14.10, 13.25, 13.05, 9.50 Condone 1 error or 1 omission
	I7	Valid decision and accurate figures	2	KL	Yes and 15.20 (finish time) OR Yes and 9.50 (start time) OR Yes and 5 hours 40 minutes and 5 hours 50 minutes OR Yes and 340 minutes and 350 minutes Note: also award marks H and J if correct answer is seen
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9a	R1	Converts between £ and \$	1 or	M	$35 \times 1.61 (=56.35)$ OR $59 \div 1.61 (=36.64\dots)$
	A4	Finds cost in £ or \$ to compare	2 or	MN	(\$) 56.35 OR (£)[36.6, 36.7]
	I7	Correct conclusion with correct figures	3	MNP	Yes and (\$)56.35 OR Yes and (£)[36.6, 36.7]
Q9b	R1	Begins to use isometric grid	1 or	Q	Uses isometric grid to draw any resized cuboid OR to attempt to draw a cuboid and one face is correct
	I6	Produces a fully correct drawing	2	QR	Isometric drawing of correct size in any orientation
Total marks for question			5		

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