

Mark Scheme (Results)

November 2011

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R1	Find number of mugs per day or number of hours	1 or	A	$4 \times 5\frac{1}{2}(=22)$ OR Uses build up method eg $3 \times 22 + 14$ OR $80 \div 4(=20)$ OR $80 \div (4 \times 5\frac{1}{2}) (=3.6363\dots)$
	A1	Correct number of days	2	AB	$[3.6, 4]$ (days) OR 3 days and $3\frac{1}{2}$ hours OR $3\frac{1}{2}$ days from clear working (eg. $66 + 14$)
Q1(b)	R2	Uses consistent units	1	C	Multiplies or divides by 1000 appropriately
	A1	Works with amount of clay needed for 1 mug	1 or	D	$'12500' \div 380 (=32.89)$ OR $12.5 \div '0.38' (=32.89)$ OR $80 \times 380 (=30400)$ OR $80 \times '0.38' (=30.4)$ Units may be inconsistent
	A1	Works out number of bags	2	DE	$80 \div '32.89' (=2.432)$ OR $80 \div ('32.89'$ rounded up or down to an integer value') OR Uses a build up method to 80 mugs $'30400' \div '12500' (=2.432)$ OR $'30.4' \div 12.5 (=2.432)$ OR Uses a build up method to 30.4 kg $80 \times 380(=30400)$ and $3 \times '12500'(=37500)$ OR $80 \times '0.38'(=30.4)$ and $3 \times 12.5(=37.5)$ Units may be inconsistent
	I1	Correct number of bags as a whole number	1	F	3 (bags)

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(c)	R2	Works out cost of materials for 16 vases or 1 vase	1 or	G	$16 \times 6.50 (=104)$ OR $14.46 \div 16 (=0.90375)$ or 90p or 91p
		Completes calculation of costs	2	GH	'104' + 14.46 (=118.46) OR $6.5 + '0.90375' (=7.40375)$ or 7.40 or 7.41
	R3	Works with percentage	1 or	J	'7.40375' \times 0.75 (=5.55...) oe OR $7.40 \times 0.75 (= 5.50)$ OR '118.46' \times 0.75 (=88.845) oe OR $0.75 \times$ (any money calculated from 14.46 and/or 6.50)
	A1	Adds on profit	2 or	JK	'88.845' + '118.46' OR '7.40' + '5.55' OR '7.40375' \times 1.75 OR $1.75 \times$ (any money calculated from 14.46 and/or 6.50) OR correct answer from 'money' increased by 75%
	I1	Calculates selling price	3	JKL	[(£)12.9(0) , (£)13]
Total marks for question			11		

Q2	R1	Uses scale	1 or	M	Two of: Correct width (10 sq), correct depth (3 sq), suitable position
	I1	Uses scale and constraints	2	MN	Rectangle with all of: Correct width (10 sq), correct depth (3 sq), suitable position,
Total marks for question			2		
Q3	A1	Appropriate graph or chart (eg bar, stick, line graph)	1 or	P	1 of linear scale, clear labels, plotting (2mm tolerance)
	I1		2 or	PQ	2 of linear scale, clear labels, plotting (2mm tolerance)
	I1		3	PQR	All of linear scale, clear labels, plotting (2mm tolerance)
Total marks for question			3		

Section B: Working for a airline

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	A1	Finds total time	1	A	6 hours 45 minutes or 6 $\frac{3}{4}$ hours oe
Q4(b)	R2	Works with time	1 or	B	'6h 45m' + 5h 30m + 3 (=15 h 15 min) OR 0500 + 15h15mins (= 20 15) Condone use of 5 hours 15 minutes instead of 5 hours 30 minutes
	I1	Correct comment	2	BC	Correct decision ft from (a) with 'correct duration' or 19 15 with 'correct landing time' oe
Total marks for question			3		
Q5(a)	R1	Calculates allowance	1 or	D	$78 \times 3.47 (=270.66)$
	A1	Process to work out saving	2 or	DE	'270.66' - 84
	I1	Correct amount	3	DEF	(£)186.66

Q5(b)	R2	Works out average amount spent	1 or	G	2480 ÷ 320 (=7.75) OR 6 × 320 (=1920) or 7.99 × 320 (=2556.8)
	I1	Identify percentage	2	GH	7.75 and 7% OR 1920 and 2556.8 and 7%
	R1	Works with percentage or individual amount	1	J	2480 × 0.07 (=173.6) oe OR 2480 × 0.05 (=124) oe OR 2480 × 0.09 (223.2) oe OR 2480 ÷ 8 (=310)
	A1	Finds individual amount or works out total for £20 bonus	1 or	K	'173.6' ÷ 8 (=21.7) OR 20 × 8 (=160) OR 0.07 × '310' (=21.7) oe OR 0.05 × '310' (=15.5) oe OR 0.09 × '310' (=27.9) oe
	A2	Correct amount	2	KL	21.7 or 160
	I2	Correct decision	1	M	With 21.7 or 160 and 173.6(0) – Yes OR No with reason Eg. No as the bonus is more than £20 or £173.60 is more than £160 OR fit from their '21.7' or '160' and '173.6' for correct decision with reason if appropriate
Total marks for question			9		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	R3	Uses conversion	1 or	N	$40 \div 1.64 (=24.39\dots)$ OR $20 \div 1.64 (=12.19\dots)$ OR $18 \times 1.64 (=29.52)$
	A1	Works out change	2 or	NP	$'24.39' - 18 (= 6.39)$ OR $'12.19' \times 2 - 18 (=6.38)$ OR $2 \times 20 - '29.52' (=10.48)$
	I2	Correct change found	3	NPQ	\$10.48 or £6.39 or £6.38 correct units and correct money notation
Q6(b)	A2	Suitable check – any reverse calculation or estimation	1	R	Must be a different calculation Eg. $'10.48' + '29.52'$, $'29.52' \div 1.64$ or using an estimate eg. $2 \times 20 - 18 \times 2$
Total marks for question			4		

Section C: Canal holiday

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(a)	I1	Finds information in table	1	A	(£)1320
Q7(b)	R2	Works out total budget or cost of any boat for one person	1	B	$225 \times 6 (=1350)$ OR '1670' $\div 6 (=278.33..)$ where 1670 is any figure from table or reduced price of any boat
	R3	Uses fraction	1 or	C	Using any figure from table $\frac{1}{4} \times 1670 (= 417.5)$ OR $\frac{1}{4} \times 1780 (= 445)$ OR $1350 = \frac{3}{4}$ of original price OR $1350 \div 3 (=450)$ OR $\frac{1}{4} \times '278.33' (=69.58..)$
	A1	Finds amount after discount	2 or	CD	Using any figure from table $1670 - '417.5' (= 1252.5)$ OR $1780 - '445' (= 1335)$ OR '450' $\times 4 (=1800)$ OR $1350 \times \frac{4}{3} (=1800)$ OR '278.33' $- '69.58' (= 208.746..)$
	A1	Finds cost of largest boat or maximum price	3	CDE	1252.5 or 1335 or 208.75 or 222.5 or 1800
	I2	Communicates result	1	F	Wye on Jun 9 – Jun 15 or Wye on Jun 16 – Jun 22
Total marks for question			6		

75% of prices in table per boat

	Medway	Tyne	Derwent	Wye
Jun 2 – Jun 8	881.25	1098.75	1305	1440
Jun 9 – Jun 15	742.5	926.25	1102.5	1252.5
Jun 16 – Jun 22	795	990	1177.5	1335
Jun 23 – Jun 29	840	1046.25	1245	1402.5
Jun 30 – Jul 7	918.75	1143.75	1361.25	1511.25

75% of price in table per person

	Medway	Tyne	Derwent	Wye
Jun 2 – Jun 8	146.875	183.125	217.5	240
Jun 9 – Jun 15	123.75	154.375	183.75	208.75
Jun 16 – Jun 22	132.5	165	196.25	222.5
Jun 23 – Jun 29	140	174.375	207.5	233.75
Jun 30 – Jul 7	153.125	190.625	226.875	251.875

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
8(a)	R1	Begins to substitute or reverse calculate	1 or	G	$120 \times 3 (= 360)$ OR $860 - 400 (=460)$
	A1	Completes substitution or calculation	2 or	GH	'360' + 400 (=760) OR '460' \div 3 (=153.33...) OR '460' \div 120 (=3.83...)
	I2	Decision from accurate figures	3	GHJ	No with 760 or 3.83...or 153.333...
Q8(b)	R1	Works with distance or time	1 or	K	$20 \div 4 (=5)$ OR $60 \div 15 (=4)$
	A1	Works with time and distance or locks	2 or	KL	$8 - '5' (=3)$ OR $14 \div 4 (= 3.5)$ OR $14 \times 15 (=210 \text{ (mins) or } 3.5 \text{ (hours)})$
	I2	Decision with correct figure	3	KLM	No and can only go through 12 locks or can only travel 18 miles or journey time is 8.5 hours or 8 h 30 mins oe
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R1	Interprets some information for one boat or one activity	1 or	N	At least one boat assigned to cleaning, fuel and water OR All boats assigned to one activity
	I1	Interprets all information all boats	2	NP	All boats assigned to cleaning, fuel and water
	I1	Links times with activities for one boat or one activity	1 or	Q	Correct start times for 1 boat for cleaning, fuel and water OR Correct start times for 4 boats for one activity
	A2	Links times with activities for all boats	2	QR	All boat identified for all activities and All of Start at or after 9 am, Finish by 3 pm, Times which allow at least 2 ½ hours for cleaning, at least 1 hour for fuelling, at least ½ hour for water for all 4 boats
Total marks for question			4		

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