Mark Scheme (Results)

October 2012

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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÷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 question**s: 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 –	**1**	1 of	

(e.g. bar, stick, line graph,)	**or**	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: Care home

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Starts process to work with ratio	1 or	A	8 × 7(=56) **OR** 32 ÷ 7(=4.57..) **OR** 32 ÷ 8(=4) **OR** 8 × 4(=32) **OR** 1:7, 2:14, 3:21, 4:28 ....(8:56)
	I7	Correct decision and correct figures	2	AB	Yes **AND** she has 1 staff for 4 people **OR** Yes **AND** 1:4 **OR** Yes **AND** she only needs 5 staff **OR** Yes **AND** she could have 56 residents
Q1b	R1	Considers features for at least one staff	1 or	C	Correct schedule for 1 member of staff or a schedule with no more than 5 errors or omissions.
	I6	Develops solution	2 or	CD	A schedule with no more than 3 errors or omissions
	A5	Coordinates all features in a fully correct checked solution	3	CDE	All of: Three 15 minute breaks and three 45 minute breaks with no overlaps start and finish times shown (finish time may be implied) no earlier than 12 pm and by 1 am for first break finish breaks by 6 am must have a break between 3 am and 8 am
Total marks for question			**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2a	R2	Correct conversion mm to m	1	F	100 mm = 0.1 m
	A4	Substitutes in formula	1 or	G	$22 \times 17 \times$ '0.1'(=37.4) accept $22 \times 17 \times 100$ (=37400) for this mark only
	A4	Processes formula to correct answer	2	GH	37.4 (m^3)
Q2b	R2	Begins to calculate cost	1 or	J or	40×60(=2400) **OR** 4×225(=900)
	A4	Calculates cost before VAT	2	K	'40×60' + '4×225'(=3300)
	R3	Works with VAT of any cost by any valid method	1 or	L	'3300' $\times$ 1.2(=3960) **OR** '3300' $\times$ 0.2(=660) **OR** e.g. '900' $\times$ 1.2(=1080) **OR** '2400' $\times$ 1.2(=2880) o.e.
	I6	Complete correct process	2	LM	(£)3960
	A5	Completes valid check of working	1	N	Valid check of working shown e.g. 3960 ÷ 1.2(=3300)
Q2c	R1	Draws plan view	1	P	Uses grid and draws one rectangle only
	A4	Uses scale on isometric grid	1 or	Q	Uses grid and draws a rectangle with sides in ratio 1:4 **OR** 1 side of rectangle is correct length for their completed scale **OR** Draws a right angled triangle correct length and height for their completed scale
	I6	Draws correct plan	2	QR	Uses grid and draws a rectangle ratio of sides 1:4 **AND** Their scale completed correctly
		Total marks for question	**11**		

Section B: Fish farming

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R3	Begins to process information	1 or	A	12 000 000 ÷ 250(=48 000 minutes) **OR** multiplies two of: 30, 24, 60, 250
	A4	Develops solution	2 or	AB	'48 000' ÷ 60 (= 800 hours) **OR** multiplies three of: 30, 24, 60, 250
	I6	Full process to find figures to compare	3	ABC	'800' ÷ 24(= 33.33… days) **OR** multiplies All of: 30, 24, 60, 250 (=10 800 000) **OR** 30 × 24 × 60 (=43200)
	I7	Correct decision accompanied by valid working	1	D	Yes **AND** Over 30 days **OR** Yes **AND** 10 800 000 (litres) **OR** Yes **AND** 43200 **and** 48000
		Total marks for question	**4**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4a	R1	Substitutes in formula or uses formula for area of circle	1 or	E	0.785×72^2 (=4069.44) **OR** $4050 \div 0.785$ (= 5159.23...) **OR** $\pi \times 36^2$ (=4071.50.....)
	A4	Complete process to find figures to compare	2 or	EF	0.785×5184 (= 4069.44) **OR** $\sqrt{5159.23...}$ (= 71.82..) **OR** $\pi \times 1296$ (=4071.50.....)
	I7	Valid decision based on correct answer	3	EFG	e.g. YES **and** 4069.44 **OR** 71.8 **OR** 4071.50
Q4b	R3	Works with weight of fish	1	H	$1000 \div 8$(=125) **OR** $1000 \div 4$(=250) **OR** e.g. Uses e.g. 450 g of each type of fish
	A4	Starts to co-ordinate weight with number	1 or	J	$900 - \text{‘}125\text{’} - \text{‘}250\text{’}$(=525) **OR** $900 - \text{‘}125\text{’}$(=775) **OR** $900 - \text{‘}250\text{’}$(=650) **OR** e.g. 450 x 8 (= 3600) and 450 x 4 (=1800)
	A5	Develops solution for total weight and total number of fish	2	JK	$\text{‘}525\text{’} \times 4$(=2100) **OR** $\text{‘}525\text{’} \times 8$(=4200) **OR** $\text{‘}775\text{’} \times 4$(=3100) **OR** 650×8(=5200) **OR** e.g.‘3600’ and ‘1800’
	I6	Starts to work with costs	1 or	L	1000×1.10(=1100) **OR** $\text{‘}3100\text{’} \times 1.55$(=4805) **OR** 1000×1.55(=1550) **OR** $\text{‘}5200\text{’} \times 1.10$(=5720) **OR** e.g. ‘3600’ × £1.10 (=£3960) and ‘1800’ × £1.55 (=£2790)
	I7	Finds correct total cost	2	LM	(£)5905 **OR** (£)7270 **OR** correct cost for their correct valid combination e.g. (£)6750
Total marks for question			**8**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Works with area	1	N	$(80 \times 80) - 6000 (=400)$
	A4	Process to find weight of 5 bags or amount of seed needed or area covered per bag	1	P	$5 \times 250 (=1250)$ **OR** '400' $\times 3 (=1200)$ **OR** $250 \div 3 (=83.33....)$
	A4	Process to find figures to compare	1 or	Q	'400'$\times 3 (=1200)$ **AND** $5 \times 250 (=1250)$ **OR** '1250' $\div 3 (=416.66..)$ **OR** '1250' $\div$ '400'$(=3.125)$ **OR** '1200' $\div 250 (=4.8)$ **OR** $400 \div$ '83.33..' $(=4.8)$ OR '83.33..' $\times 5 (=416.66..)$
	I7	Valid decision from correct figures	2	QR	Yes **AND** 1200 **and** 1250 **OR** Yes **AND** 400 **and** [416,417] OR Yes **AND** 3.125 **OR** Yes **AND** 4.8
Total marks for question			**4**		

Section C: Slimming Club

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R1	Works with height conversion or weight conversion	1 or	A	5 × 12 + 3 (=63) **OR** 10 × 14 + 10 (=150)
	A4	Correct height conversion and weight conversion	2	AB	63 (inches) and 150 (pounds)
	R2	Identifies target weight	1 or	C	[139, 141] (pounds) may be seen on graph ft their 63
	I7	Works out number of pounds to categorise as 'normal'	2	CD	[9,11] pounds ft their plotted point
			Total marks for question	**4**	

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7a	R1	Complete correct process for mean	1 or	E	(2000 + 2000 + 1800 + 1900 + 2060 + 1850 + 1900) ÷ 7 **OR** 13510 ÷ 7 **OR** 2000 + (0 + 0 − 200 − 100 + 60 − 150 − 100) ÷ 7 **OR** 2000 − (490 ÷ 7)
	A4	Finds mean	2	EF	1930
Q7b	R2	Works out total number of calories for 6 pounds weight reduction or total calorie intake in 9 weeks	1	G	3500 × 6(=21000) **OR** '13510' × 9 (=121590) **OR** '1930' × 63 (=121590)
	R3	Works out calories per week for no weight loss or calories saved per day or calories used in 9 weeks	1 or	H	2200 × 7(=15400) **OR** 2200 − 1930(=270) **OR** 2200 × 63 (=138600)
	A4	Compares total number of calories used with calorie intake	2	HJ	'15400' − '13510'(=1890) **OR** 270 **OR** 138600 − 121590 (=17010)
	I6	Process to calculate figures to compare	1 or	K	'21000' ÷ '1890'(=11.11...) **OR** 9 × 1890(=17010) **OR** '21000' ÷ 270(=77.7..) **OR** '17010' ÷ 3500 (=4.86)
	I7	Valid decision from accurate figures	2	KL	No **AND** 11.1 weeks or 10.1 weeks if previous week inc. **OR** No **AND** 17010 **AND** 21000 **OR** No **AND** [4, 5] pounds
		Total marks for question	**7**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8a	R1	Uses formula to work out target weight	1 or	M	$106 + 6 \times 10 \ (= 166)$
	A4	Finds weight loss	2	MN	14 (pounds)
Q8b	R1	Works with fractions	1 or	P	$\dfrac{7}{140}$ **AND** $\dfrac{12}{180}$ **OR** $\dfrac{1}{20}$ **OR** $\dfrac{1}{15}$ **OR** 0.05 **OR** 0.066.. **OR** 5% **OR** 6.6..%
	I6	Finds comparable figures	2 or	PQ	$\dfrac{1}{20}$ **AND** $\dfrac{1}{15}$ **OR** 0.05 **AND** 0.066.. **OR** 5% **AND** 6.6..%
	I7	Decision from accurate figures	3	R	No **AND** correct figures
Total marks for question			5		