Mark Scheme (Results)

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Shows how to total amounts for total cost	1 or	A	(2 × 22.50) + 156 + 63 (=264)
	A1	Totals correctly	2	AB	(£)264
Q1b	R1	Works with percentage	1 or	C	Shows method for 20% e.g. 0.2 × '264' **OR** '264' × 1.2 (=316.8) oe **OR** full method for 20% of any relevant amount
	A1	Complete process for percentage increase	2	CD	316.8 **OR** 27 **OR** 54 **OR** 75.6 **OR** 187.2 **OR** 211.2 **OR** 18 **OR** 36 **OR** 50.4 **OR** 124.8 **OR** ft
	R1	Works with discount	1 or	E	'316.8' ÷ 3 (=105.6) **OR** '316.8' ÷ 3 × 2 (=211.2) **OR** uses % **OR** full method for 1/3 or 2/3 of any relevant amount
	A1	Complete process to find price after discount	2	EF	211.2 **OR** 18 **OR** 36 **OR** 50.4 **OR** 124.8 **OR** 176 **OR** 30 **OR** 42 **OR** 104 **OR** ft
	I1	Gives answer after both fraction and percentage change	1	G	(£)211.2(0)
Total marks for question			**7**		
Q2	R2	Starts to design a form	1 or	H	Gives 3 headings out of Name, start date, drive, professionalism, experience, communication, with input opportunities
	I1	Improves form	2or	HJ	Gives 5 headings out of Name, start date, drive, professionalism, experience, communication, with input opportunities
	I1	Designs efficient form	3	HJK	Gives all of headings of Name, start date, drive, professionalism, experience, communication, with efficient input opportunities, at least inputs for 4 people
Total marks for question			**3**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3(a)	R2	Works with mileage and fuel consumption	1 or	L	283 × 0.32 (=90.56) **OR** 283x32(=9056) **OR** 100 ÷ 0.32 (=312.5) **OR** 100 ÷ 283 (=0.35..)
	I2	Decision from correct figures	2	LM	No **AND** £90.56 **or** 312.5 miles **or** 35p **or** £0.35
Q3(b)	R2	Starts to consider constraints	1 or	N	Sequential plan with correct times for 4 events within constraints
	I1	Develops schedule	2 or	NP	Sequential plan with correct times for 5 events within constraints
	A2	Improves schedule	3 or	NPQ	Sequential plan with correct times for 6 events within constraints and no overlapping deliveries
	I1	Complete correct schedule	4	NPQR	Sequential plan with correct times for **all** events within constraints including correct first delivery, last delivery allowing return to warehouse by 4.30, lunch, 5 correct delivery slots and no overlapping deliveries
Total marks for question			**6**		

Section B: The fair

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R2	Starts to find amount needed or finds raffle tickets needed to cover costs	1 or	A	350 + 63.1 (=413.1) **OR** 63.1 ÷ 0.50 (=126.2) **OR** 350 ÷ 0.50 (=700)
	A1	Betters methods to find number of raffle tickets	2 or	AB	'413.1' ÷ 0.50 (=826.2) **OR** '126.2' + '700' (=826.2) **OR** 127 and 700
	I2	Finds number of raffle tickets	3	ABC	827 (tickets)
Total marks for question			**3**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R3	Begins to use proportion	1 or	D	E.g. Shows any of the values ÷ 12 or ÷ 2 or ÷ 4 **OR** 1 of 1000 ÷ 175 (=5.7) or 600 ÷ 110 (=5.45) or 750 ÷ 110 (=6.81) or 12 ÷ 2 (=6) OR Finds scale factor 60 ÷ 12 (=5) or 50 ÷ 12 (=4.16...) (5 may be embedded) **OR** uses a build-up method for one ingredient for at least 48 cakes
	A2	Full process to compare quantities for one item	2 or	DE	Any recipe quantity ÷ 12 then × [50,60], or ÷ 2 then × [8.3,10] or ÷ 4 then × [16.6,20] etc allow figures rounded/truncated **OR** Any recipe quantity × 5 **or** 4.16..could be embedded in a calculation eg 5x110 (=550)**OR** 1 of: SRF [725,875], M [455,550] , CS [455,550], eggs [8,10] **OR** 1 of: 1000 ÷ 175 (=5.7) or 600 ÷ 110 (=5.4..) or 750 ÷ 110 (=6.8..) or 12÷ 2 (=6) **AND** 5 or 4.16.. **or** × 12 **OR** uses a build-up method for SR, M/CS and eggs for at least 48 cakes
	I1	Full process to compare quantities for flour, margarine and eggs	3 or	DEF	All recipe quantities ÷ 12 then × [50,60], or ÷ 2 then × [8.3,10] or ÷ 4 then × [16.6,20] etc allow figures rounded/truncated **OR** All recipe quantities × 5 **or** 4.16.. could be embedded in a calculation **OR** All of: SRF [725,875], M [455,550], eggs [8,10] **OR** All of: 1000 ÷ 175 (=5.7) **and** 600 ÷ 110 (=5.4...) **and** 750 ÷ 110 (=6.8..) **and** 12÷ 2 (=6) **AND** 5 or 4.16... **or** × 12 **OR** uses a build-up method for SR, M/CS and eggs for at least 50 cakes
	I2	Gives decision from correct figures and correct processes	4	DEFG	Yes **AND** correct figures for SRF, M and eggs from correct processes
Total marks for question			4		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6a	R2	Works with lengths	1	H	10 − 1 (=9) **OR** 1 + 3 (=4) **OR** 2 + 1 (=3) **OR** 20-1-2(=17) **OR** 10-1-3(=6)**OR** 20 − 1 (=19) check any values indicated on diagram or in answer box
	R3	Process to find area of a rectangle	1 or	J	20 × 10 (=200) **OR** '17' × '9' (=153) **OR** 20 × 1 (=20) **OR** 10 × 1 (=10) **OR** 2 × 3 (=6) **OR** '19' × '9' (=171) **OR** 19 × 6 (=114) **OR** 17 × 3 (=51) **OR** 2 x '6'(=12) etc.
	A1	Fully correct process for available floor area	2 or	JK	**Correctly** combines areas at least 2 of: 20 × 10 (=200), '17' × '9' (=153), 20 × 1 (=20), 10 × 1 (=10), 2 × 3 (=6), '19' × '9' (=171), 19 × 6 (=114), 17 × 3 (=51)
	I1	Completes calculation	3	JKL	165 (m^2)
Q6b	R2	Starts to work with formula	1 or	M	'165' × 3 ÷2 (=247.5) this is ft their answer to 6a
	A1	Completes substitution	2 or	MN	247.5 ft
	I2	Appropriate rounding to find the maximum number of people	3	MNP	247 (people)
Q6c	R1	Works with scale	1 or	Q	Rectangle drawn with correct length (12cm) **OR** correct width (9cm) **OR** correct length **and** correct width stated
	A1	Completes diagram	2	QR	Rectangle with correct length (12cm) **AND** correct width (9cm) (±2mm)
Total marks for question			**9**		

Section C: Shopping

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R1	Works with contract yearly or monthly	1 or	A	360 ÷ 12 (= 30) **OR** 25 × 12 (=300)
	R2	Works with extra calls or texts	1 or	B	400 − 350 (=50) **OR** 300 − 200 (=100) **OR** no extra text charge for Better phones
	A1	Works with cost of extra calls or texts	2 or	BC	50 × 0.1 (=5) **OR** 100 × 0.05 (= 5) **OR** 50 × 0.15 (=7.5) **OR** 12 × 50 × 0.1 (=60) **OR** 12 × 100 × 0.05 (= 60) **OR** 12 × 50 × 0.15 (=90)
	A1	Complete process for extra calls and texts	3	BCD	50 × 0.1 **+** 100 × 0.05 (=10) **AND** 50 × 0.15 (=7.5) **OR** 12×50×0.1 **+** 12×100×0.05 (= 120) **AND** 12 × 50 × 0.15 (=90)
	I1	Full process to compare monthly cost or to compare yearly costs	1 or	E	(25) **and** 10 **and** 30 **and** 7.5 **OR** 35 **and** 37.5 **OR** 420 **and** 450 **OR** 300 **and** 120 **and** (360) **and** 90
	I2	Makes correct decision from correct figures	2	EF	Offer A (Alright Mobiles) **AND** (25) **and** 10 **and** 30 **and** 7.5 **OR** 35 **and** 37.5 **OR** 420 **and** 450 **OR** 300 **and** 120 **and** (360) **and** 90
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8a	A1	Reads rainfall	1	G	15 ≤ rainfall < 20
	A1	Reads temperature	1	H	27 ≤ temperature < 30
Q8b	I2	Makes one simple statement	1 or	J	Makes one simple statement e.g. More rainfall in Florence than Marseilles (in July may be implicit)
	I2	Makes two statements at least one of which must be comparative	2	JK	Makes two statements at least one of which is comparative **OR** one complex statement e.g. It is warmer and wetter in Florence in summer than Marseilles
		Total marks for question	**4**		
Q9	R1	Converts units	1 or	L	90 ÷ 2.54 (=35.43..) **OR** allow 90 ÷ 2.5 (=36) **OR** Any belt length × 2.5(4)
	A1	Finds length to compare	2	LM	35.43... **OR** 91.44 and 86.36 Allow 35 or 36 provided correct process seen in L
	I2	Uses constraints to make valid decision	1	N	Jerry 36 or medium **OR** Rafe 36 or medium Allow ft from their lengths provided mark L is awarded
		Total marks for question	**3**		
Q10	R1	Works with time	1	P	4 hours 45 minutes **OR** 5 hours **OR** 13:25 **OR** 6:10 (pm) oe seen
	A1	Completes calculation of cost	1 or	Q	3.30 + 2 × 1.80 (=6.90) allow ft from their hours
	A1	Finds change	2	QR	£3.10 correct money notation
		Total marks for question	**3**		