Mark Scheme (Results)

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Begins to produce data collection sheet	1 or	A	Input opportunities **AND** headings for at least 2 of : male/female, age over/under 30, frequency of travel
	R2	Improves data collection sheet	2 or	AB	Input opportunities **AND** headings for all of male/female, age over/under 30, frequency of travel
	I6	Fully correct efficient data collection sheet.	3	ABC	Data collection sheet showing all categories in a two way table with efficient input opportunities (questionnaire is not efficient)
Q1b	A4	Reads pie chart	1 or	D	Travel to work **OR** '124' and '135'
	I7	Makes correct comparative statement	2	DE	No **AND** travel to work is bigger **or** biggest (area, angle or sector) **OR** No and appropriate angles
Total marks for question			**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2a	A4	Process to calculate mean	1 or	F	$(89 + 87 + 86 + 89) \div 4 (=87.75)$ **OR** $(91 + 85 + 84 + 91) \div 4 (=87.75)$ **OR** Allow mean of all 8 figures
	I6	Accurate figures to compare means	2	FG	87.75 **AND** 87.75
	R2	Calculates range for one year	1 or	H	$(89 - 86 =)3$ **OR** $(91 - 84 =)7$
	A4	Calculates range for both years	2	HJ	3 **AND** 7
	I7	Makes comparison statement using mean **and** range Ft. their figures provided marks F and H are awarded	1	K	e.g. The mean average percentage of late trains is the same but the trains were more consistent in 2011 as the range was smaller. Ft. their figures provided marks F and H are awarded
Q2b	R2	Process to work with probability or percentage	1 or	L	$100 - 85 (= 15)$ o.e **OR** $\dfrac{1}{10} \times 100 (=10)$ **OR** $1 - \dfrac{1}{10}\left(=\dfrac{9}{10}\right)$ **OR** $\dfrac{85}{100}$ condone use of 87
	A4	Process to find figures to compare	2 or	LM	$100 - 85 (= 15)$ o.e. **and** $1/10 \times 100 (=10)$ **OR** $\dfrac{'9'}{10} \times 100 (=90)$ **OR** $\dfrac{3}{20}$ o.e. condone use of 87
	I7	Decision with accurate figures (if fractions, denominators must be equal)	3	LMN	No **AND** 15(%) and 10(%) **OR** No **AND** 90(%) **OR** No **AND** $\dfrac{3}{20}$ **and** $\dfrac{2}{20}$ o.e.

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2c	R2	Identifies information for graph or chart	1 or	P	1 of: Suitable labels (month, year, %), linear scale, plotting 2mm tolerance
	A4	Draws graph or chart	2 or	PQ	2 of: Suitable labels (month, year, %), linear scale, plotting 2mm tolerance
	I6	Accurate graph or chart	3	PQR	All of: Suitable labels (month, year, %), linear scale, plotting 2mm tolerance Minimum label must be % early, (not amount or % late)
		Total marks for question	**11**		

Section B: A new bedroom

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3a	R2	Works with area of floor or packs	1 or	A	3.5×2.74 (= 9.59 m^2) **OR** 3×2.5 (=7.5 m^2)
	A4	Works with area of floor and packs	2 or	AB	3.5×2.74 (= 9.59 m^2) **and** 3×2.5 (=7.5 m^2) **OR** '9.59'÷ 3(=3.19...) **OR** '9.59'÷ 2.5(=3.836)
	I7	Correct decision from correct figures	3	ABC	No **AND** 9.59 (m^2) **AND** 7.5(m^2) **OR** No **AND** [3.1, 3.2](m^2) (per pack) **OR** No **AND** [3.8, 3.9] or 4 (packs needed)
Q3b	A4	Begins to substitute into formula.	1 or	D	$8.19 - 1.43$(=6.76)
	R1	Full process for substitution	2 or	DE	$\dfrac{2(8.19 - 1.43)}{10} = 1.352$
	I7	Calculates amount of paint needed	3	DEF	1.3(52) accept rounded answers

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3c	R2	Process to find length of coving needed	1	G	3.5 + 3.5 + 2.74(=9.74)
	A4	Works with length of coving and rounds up to whole strips	1 or	H	'9.74' ÷ 2 (= 4.87) **and** '5 strips' **OR** '9.74' ÷ 2.6 (= 3.74..) **and** '4 strips' **OR** Complete build up method for 2 m or 2.6 m Ft must come from adding lengths, not from areas **OR** Works in whole strips for all walls **and** 6 strips
	I6	Process to find wastage	2 or	HJ	'5' × 2 (= 10) **and** '10' − '9.74'(=0.26) **OR** '4' × 2.6(= 10.4) **and** '10.4' − '9.74'(=0.66) **OR** 12 − 9.74 (=2.26)
	I7	Correct decision and correct remainder	3	HJK	Chooses Classic (2m) strips **AND** 0.26 m **or** 0.13 strips Units must be given
Total marks for question			**10**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4a	R1	Process to find number of doors needed.	1 or	L	2740 ÷610(=4.4....) **OR** 4×610(=2440) **and** 5×610(=3050) **OR** 2740 ÷762 (=3.5..) **OR** 3×762(=2286) **and** 4 ×762(=3048) **OR** 2740 ÷ 914 (= 2.9....) **OR** 2×914(=1828) **and** 3×914(= 2742)
	A4	Process to find cost of doors to compare.	2 or	LM	'5'×95(=475) **OR** '4'×105(=420) **OR** '3'×115(=345)
	I7	Finds correct costs of overlapping doors to compare	3	LMN	(£)475 **AND** (£)420 **AND**(£)345
	17	Correct decision	1	P	3 doors **and** £345
Q4b	R1	Processes scale	1 or	Q	[11.5, 11.8] × 20 (= [230, 236])o.e. allow [11.9, 12.1] × 20 (= [238, 242]) condone width [13.5, 13.7] × 20 (= [270, 274])
	A4	Accurate answer	2	QR	[232, 236] (cm)
Total marks for question			**6**		

Section C: The balloon flight experience

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R3	Process for percentage	1 or	A	0.4×155 (=62) **OR** 0.6 ×155 (=93) **OR** 0.4×310 (=124) **OR** 0.6 ×310 (=186)
	A4	Complete process to find cost of Fly High Balloons	2	AB	0.6 ×155 (=93) **OR** 155 – (0.4×155) (=93) **OR** 2×0.6 ×155 (=186) **OR** 2 × [155 – (0.4×155)] (=186)
	R3	Complete process to find cost of Anytime balloons	1 or	C	$\frac{2}{3}$ ×138(= 92) **OR** 138 − $\frac{1}{3}$ ×138(=92) **OR** $2 \times \frac{2}{3}$ ×138(= 184) **OR** 2× 138 − $\frac{1}{3}$ ×138(=184) allow use of 0.33 or 0.66 or better
	I6	Accurate figures to compare	2	CD	(£)93 **and** (£)[91.08, 92] **and** (£)95 **OR** compares (£)186 **and** (£)[182.16, 184] with £190
	I7	Makes decision with correct figures	1	E	States Anytime Balloons and £184
Total marks for question			**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R1	Begins to process time	1 or	F	1700 to 2100= 240 min **OR** at least 3 correct time calculations e.g. 15+20+90+40+10+30 +45 = 205 + 45=250min **OR** 17:15 , 17:35, 19:05, 19:45,19:55, 20:25, 21:10 **OR** 21:00, 20:15, 19:45, 19:35, 18:55, 17:25, 17:05, 16:50
	A4	Fully correct process for time Or correct time to meet pilot	2 or	FG	Finds correct time that they will return home 21:10 **OR** 16:50 **OR** 240 min **and** 250min **OR** 4 hrs **and** 4.16 hrs
	I7	Decision based on correct figures.	3	FGH	No and 21:10 **OR** 16.50 **OR** No and 240min **and** 250 min **OR** 4 hrs **and** 4.16 hrs
Total marks for question			**3**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7a	R2	Process to convert units	1 or	J	65 × 2.2 (=143 pounds) **OR** 150 ÷ 2.2(=[68.1, 68.2] kg)
	I7	Decision from correct figures	2	JK	Decision based on correct figures 143 pounds or [68.1, 68.2] kg
	A5	Shows appropriate check	1	L	eg reverse calculation, estimation, alternate method
Q7b	A4	Begins to calculate item totals	1 or 2	M MN	3 ×135(=405) **AND** 5 × 150(=750) 7517(pounds)
Q7c	A4	Uses consistent units	1	P	$\dfrac{3}{4}$ = 45 minutes **OR** −720 feet per hour
	R1	Process to find time taken to descend or distance travelled in 45min	1	Q	500÷ 12 = 41(.66...) **OR** ' 45' × (−)12= (−)540 (feet) **OR** $\dfrac{3}{4}$ × '720' =(−)540 (feet)
	I7	Decision with correct figures	1	QR	compare 41.6(6) and 45 **OR** decision and 540 **OR** **e.g. YES** only 4 min off or similar
Total marks for question			**8**		