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Mark Scheme (Results)

January 2012

Functional Skills Mathematics (FSM02) Level 2

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R1	Works with 75%	1 or	A	0.75×4.35(=3.26..) or 1.75 × 4.35(=7.61..) **OR** a **complete** build up method with a clear process **and** a clear intention to add.
	A1	Complete calculation	2	AB	7.59 or 7.6 or 7.61 or 7.6125 or 7.62
	I2	Finds the menu charge	1	C	£7.59, £7.60, £7.61, £7.62, £7.65, £7.70, £8 in correct money notation only.
Q1b	R1	Process to calculate weight of potatoes each week	1 or	D	7 × '14' (=[98,119]) (kg) using any value in [14,17].
	A1	Process to find number of sacks needed	2	DE	'[98,119]'÷12.5 = [7.84,9.52] **OR** n × 12.5 and [98,119] where n=8,9,10
	I1	Finds correct number of sacks	1	F	8 or 9 or 10 **AND** must score Mark D
Q1c	A1	Finds cost of potatoes	1	G	(£)30 or (£)33.75 or (£)37.5(0) ft their whole number answer to part (b)
		Total marks for question	**7**		

Q2	A1	Converts a unit	1	H	0.8 (kg) **OR** 25000 (g) **OR** 9.6 (kg) The above may be seen within a calculation.
	R2	Uses the 800 g of flour	1	J	**eg**: **'**25000' ÷ 800 (=31.25) **OR** 800 × 12 (= 9600)
	R3	Uses cost of flour or additional 30p per loaf for baking	1	K	1600 ÷ '31.25'(=51.2)**OR** 1600 ÷ 25 (=64)**OR** 16÷ 25(=0.64)**OR** 30(p) × 31.25 (=937.5) **OR** 30(p) × 31 **OR** 30(p) × 32
	A1	Process to find comparable figures or full cost of using 25 kg sack	1	L	1080 ÷ 12 (=90) **OR** ('51.2' + 30) × 12(=974.4) **OR** 1600 + 937.5 (=2537.5)**OR** 1600+930(=2530) **OR** 1600+960(=2560) **OR** (0.64×9.6) + (12×0.3) (= 9.74)
	I1	Finds correct comparable figures	1	M	81(p) or 81.2(p) or 82(p) **AND** 90p **OR** (£) 9.74 **OR** £25.30 **and** £27.90
	I2	Makes explicit comparison ft their figures	1	N	E.g. Buy the bread 90 (p), make bread is 82(p) is cheaper. Cheaper to bake in kitchen by 8(p) or 9(p) per loaf.
		Total marks for question	**6**		
Q3	R1	Begins to address features	1 or	P	Input opportunities for 3 courses **OR** at least 6 correct dishes
	R2	Develops data collection sheet	2 or	PQ	Clear input opportunities for 6 people(could be tallied) **and** 3 courses **OR** Clear input opportunities for 6 people (could be tallied) **and** all dishes
	I1	Fully correct data collection sheet	3	PQR	Efficient input opportunities for 6 people (could be tallied) **AND** all dishes clearly identified by heading or key
		Total marks for question	**3**		

Section B: The Alphabet Nursery

<table>
<tr><th>Question</th><th>Skills Standard</th><th>Process</th><th>Mark</th><th>Mark Grid</th><th>Evidence</th></tr>
<tr><td>Q4</td><td>R2</td><td>Uses the table to ascertain staff requirements</td><td>1 or</td><td>A</td><td>2 correct answers, in table or clearly labelled OR
Correct technique to identify staffing for at least 1
e.g. 5 ÷ 3 (=1.6..)</td></tr>
<tr><td></td><td>A1</td><td>Makes further progress in the task</td><td>2 or</td><td>AB</td><td>4 correct answers, in table or clearly labelled.</td></tr>
<tr><td></td><td>I1</td><td>Fully correct solution</td><td>3</td><td>ABC</td><td>Complete staffing needs communicated
<table>
<tr><th>Morning staff</th><th>Afternoon Staff</th></tr>
<tr><td>2</td><td>3</td></tr>
<tr><td>3</td><td>3</td></tr>
<tr><td>2</td><td>2</td></tr>
</table></td></tr>
<tr><td colspan="3">Total marks for question</td><td colspan="3">3</td></tr>
<tr><td>Q5</td><td>R1</td><td>Appropriate graph or chart – bar, stick or line graph</td><td>1 or</td><td>D</td><td>1 of linear scale(s), labels, plotting (2 mm tolerance)
Condone one error in plotting Do not condone omission</td></tr>
<tr><td></td><td>R3</td><td>Composites, duals, points plotted</td><td>2 or</td><td>DE</td><td>2 of linear scale(s), labels, plotting (2 mm tolerance)
Condone one error in plotting Do not condone omission</td></tr>
<tr><td></td><td>I1</td><td>Fully correct graph</td><td>3</td><td>DEF</td><td>3 of linear scale(s), labels, plotting (2 mm tolerance)
Condone one error in plotting Do not condone omission</td></tr>
<tr><td colspan="3">Total marks for question</td><td colspan="3">3</td></tr>
<tr><td>Q6</td><td>R3</td><td>Uses two features</td><td>1 or</td><td>G</td><td>Multiplies 2 of: 7, 2, 4.7 or 13 OR 900 ÷ 4.7 (=191.489…)</td></tr>
<tr><td></td><td>A1</td><td>Uses three features</td><td>2</td><td>GH</td><td>7 × 2 × 4.7 (=65.8 grams per day) OR
13×2 × 7 (=182 scoops for 13 days) OR
‘191.489..’ ÷ 7 (=27.35.. bottles in a tin)</td></tr>
<tr><td></td><td>A1</td><td>Complete process</td><td>1 or</td><td>J</td><td>900 ÷ ’65.8’ (= 13.6… days from a tin) OR
‘27.35..’ ÷ 2 (= 13.6.. days) OR
182 × 4.7 (=855.4 grams) OR
‘65.8’ × 13 (=855.4 grams) OR
13×2 × 7 (=182 scoops) AND 900 ÷ 4.7 (=191.489…scoops)</td></tr>
<tr><td></td><td>I2</td><td>Accurate answer and decision</td><td>2</td><td>JK</td><td>13.6… OR 855(.4) OR 191.. and 182</td></tr>
<tr><td colspan="3">Total marks for question</td><td colspan="3">4</td></tr>
</table>

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	A1	Uses correct units or explicit scale factor for depth	1	L	e.g. 0.3 (m) or 0.1 (m) **OR** 3 × depth seen
	R3	Works with area or volume	1	M	4.5 × 3.5 (=15.75) or embedded within a volume calculation. **OR** 5 × '0.1' (=0.5)
	A1	Completes process for area or volume	1 or	N	'15.75' ÷ 5 (=3.15) **OR** 4.5 × 3.5 × '0.3' (= 4.725) **OR** 3 × '15.75' (= 47.25)
	R2	Incorporates all features	2 or	NP	'3.15' × '3' (=9.45) **OR** '4.725' ÷ '0.5' (=9.45) **OR** '47.25' ÷ 5 (=9.45)
	I1	Finds answer	3	NPQ	9.45
	I2	Rounds appropriately	1	R	States 10 bags
		Total marks for question	**6**		

Section C: A trip to France

Q8a	R2	Works with capacity of fuel tank	1	A	70 ÷ 4 (=17.5) **OR** 70 ÷ 4.55 (=15.38…)
	A1	Complete process to find fuel in gallons in fuel tank	1	B	'17.5'÷4.55(=3.846…) **OR** '15.38..' ÷ 4 (=3.846..)
Q8b	A1	Works with fuel consumption	1 or	C	5×40(=200) 5 gallons to reach ferry terminal or 200÷40(=5) **OR** '3.8' × 40 (=152)
	I2	Valid decision from accurate figures	2	CD	No **AND** [3.8,3.9] **or** 4 **AND** 5 **OR** No **AND** [3.8, 3.9] **AND** [152, 156](miles) **OR** No **AND** 4 **AND** 160
		Total marks for question	**4**		
Q9	R2	Handles Champion offer	1	E	8 × 2.97 (=23.76) (for 12 boxes) **OR** 2 × 2.97 (=5.94) (for 3 boxes)
	A1	Handles Grand offer	1 or	F	eg:2.90 × 0.7 (=2.03) **OR** 2.90 × 0.3 (=0.87) **OR** uses build up method complete for 30% or 70%
	R1	Finds cost of Grand and Champion upon which a comparison can be made	2	FG	Eg: '2.03'× 12 (=24.36) and 8 × 2.97 (=23.76) (for 12 boxes) '2.03' × 3 (=6.09) and 2 × 2.97 (=5.94) (for 3 boxes) '5.94' ÷ 3 (=1.98) and 2.90 × 0.7 (=2.03) (for 1 box)
	I1	Communicates use of comparable quantities of chocolate	1	H	Has correct answers for the same number of boxes in both supermarkets. eg: 23.76 and 24.36 for 12 boxes
	I2	Valid decision. Dependent upon E, and G marks awarded.	1	J	eg: Champion **AND** 23.76 and 24.36 N.B. Marks E and G must be awarded
		Total marks for question	**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q10a	R1	Works with finish time or cycling time or rest time	1 or	K	Identifies that 2 or 3 rest periods are required **OR** works with [3,3.5](hrs) **or** 45(min) **OR** Correctly bridges an hour within a time calculation **OR** Finds cycling time in minutes = 530 (mins)
	A2	Coordinates a "clock time" with a time period	2 or	KL	Identifies that 2 or 3 rest periods are required **AND** Works with a "clock time" **and** time periods [3,3.5](hrs) **or** 45(min) **OR** calculates total time needed 10 hr 20 minutes **or** 11hr 5 min (condone 10.2 or 11.05)
	I1	Correct departure time	3	KLM	8.20(am) or 7.35(am) oe
Q10b	A1	Uses consistent units	1	N	e.g. 1.5 (hrs) **OR** 130 ÷ 60 (=2.166…) (km/min) **OR** 230÷130 (hrs)
	R1	Coordinates time and distance and speed	1 or	P	230 ÷ '1.5' (=153....) **OR** 230 ÷ 130 (=1.7...) **OR** '2.166' × 90 (=195) **OR** 130 × '1.5' (=195) **OR** ad hoc method, e.g. 130 + 65 (=195)
	A1	Calculates values	2	PQ	(S =)153.…**OR** (T=)1.7... **OR** (D=)195
	I2	Makes decision**. Ft provided P has been awarded and there is a figure for Q**	1	R	e.g. no, from consistent units allowing a comparison
Total marks for question			**7**		

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