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Mark Scheme (Results)

March 2015

Pearson Edexcel 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 indicates 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 **linearscale** 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: Dogs

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1	R2	Begins to produce data collection sheet	1 or	A	Input opportunities **AND** headings for at least 2 of: Owner name, dog name, length and days
	I6	Improves data collection sheet	2 or	AB	Input opportunities **AND** headings for all of: Owner name, dog name, length and days. (usable but not efficient) Condone questionnaire
	I6	Fully correct efficient data collection sheet.	3	ABC	Data collection sheet showing all categories in a table with efficient input opportunities. (Questionnaire is not efficient)
Total marks for question			**3**		

E.g.

Dog name	Owner name	Mon	Tues	Wed	Thur	Fri
		30 1hr	30 1hr	30 1hr	30 1hr	30 1hr
Rover						
Peggy						

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(a)	R2	Uses offer	1	D	£65 sufficient for 4 bags 3× 20.50(=61.50)
	A4	Uses consistent units	1	E	4000 (g)**or**'16000'(g)**or** 13.2(kg) **or** 0.264(kg) May be seen in subsequent calculations.
	R3	Begins to work with amount of dog food or days	1 or	F	'4000' × 4 (=16000) o.e.**OR** 50 × 264 (=13200) o.e.**OR** **'**4000' ÷ 264 (= 15.15...)
	I6	Full process to find figures to compare.	2 or	FG	'4000' × 4(=16000) **and** 50 × '264' (=13200)**OR** '15.15...' × 4 (= 60.6...)**OR** **'**16000' ÷ '264' (= 60.6..)**OR** 50 ÷ 4(=12.5) **and**'4000' ÷ '264' (= 15.15...)**OR** '13200' ÷ 4000(= 3.3) '16000'÷ 50(=320) available per day **OR** '4000' ÷ '264' (= 15.15...) **and** build up method (may use 15)
	I7	Correct decision from accurate figures	3	FGH	Yes **and**16000 **and** 13200 o.e.**OR** Yes **and** 60.6... (days)**OR** Yes **and** 15.15..days food available per bag **and** 16.6..days needed. **OR** 3.3 **and**4 bags needed **OR** 2800(g) (left over) **OR** 320(g) (per day) **OR** Yes **and** 60 supported by build up NB If this mark is awarded award marks D and E.

	A5	Check using reverse calculation or alternate method or estimation	1	J	Check using reverse calculation or alternate method or estimation
Q2(b)	R1	Starts to work with ratio	1 or	K	1 + 2(=3) **or** 264 ÷ 3(=88)
	A4	Complete process	2 or	KL	2 × '88'(=176)
	I6	Correct answer	3	KLM	176 (grams)
Total marks for question			**9**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R1	Process to find full cost of treatment with or without excess	1 or	N	155.71 + 73.58 – 70 (=159.29) **OR** 155.71 + 73.58 (=229.29) **OR** 100 – 70 (=30)
	A4	Process to work with percentages	2 or	P	0.2× '159.29'(= 31.8…) oe **OR** 155.71 + 73.58 – 70 (=159.29) **and** 100 – 70 (=30) Allow 20% of any relevant figure e.g. 0.2 × '229.29'(= 45.858) for this mark only.
	A4	Process to find figures to compare	3 or	PQ	70 + '31.858' (= 101.8…) **OR** '30' ÷ '159.29' × 100 (= 18.8...%)**OR** 155.71 + 73.58 – 70 (=159.29) **and**'30' × 5 (=150)**OR** 0.2 × '159.29'(=31.858) **and**100 – 70(=30)
	I7	Decision from accurate figures	4	PQR	No **and (**£)[101.84, 101.86] **OR** No **and**18.8...(%)**OR** No **and**(£)159.29 **and** (£)150**OR** No **and**(£)[31.84, 31.86] **and**(£)30
Total marks for question			**4**		

Section B: Concrete

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	I7	Interprets graph.	1	A	E.g. As temperature increases the concrete will set faster.**OR** The colder the temperature the longer it takes to set.
Q 4(b)	A4	Reads graph to choose day temp > 2^0C	1	B	Mon 17 **or**Wed19**or**Thu 27**or** Fri 28
	R2	Works with probability and chance	1 or	C	Tues 18 **or** Wed 19 **or** Fri 21 **or** Fri 28
	I7	Fully correct day and setting time with units	2	CD	Wed 19**and** [14,15] hours**OR** Fri 28 **and**[13,14] hours
Total marks for question			**4**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R2	Begins to engage with problem	1 or	E	Works out trucks needed for J or S or M Jackson 6+ 4+4 **or** 4+4+4 **or** 6+ 6+4 **OR** Mac 6+ 4 **or** 6+6 **or** 4+4+4 **OR** Smith 6+6 **or** 6+4+4 **or** 4+4+4 NB May be implicit in solution
	A4	Process to calculate minimum number of trucks needed.	2	EF	Works out number of trucks for all J, S and M Jackson 6+ 4+4 **or** 6+ 6+4 **OR** Macs 6+ 4 **or** 6+6 **or** 4+4+4 **OR** Smith 6+6 **or** 6+4+4 **or** 4+4+4 NB May be implicit in solution
	R1	Begins to schedule loads	1 or	G	Completes 3 rows **or** columns (at least 2 wagons in each, 1 wagon per row) of the booking sheet correctly. May finish after 15:00
	I6	Improves solution	2 or	GH	Completes 6 rows of the booking sheet correctly.
	A5	Fully correct solution	3	GHJ	Times given for Trucks loaded at 15 min intervals Sufficient concrete at all destinations Jackson 6+ 4+4 or 6+6+4 **AND** Smith 6+6 **or** 4+4+4 **AND** Mac 6+ 4 **or**6 + 6 Peter 4 Garcia 4 **or** 6 All trucks back by 15:00
Total marks for question			**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	A4	Work with consistent length or mass	1	K	1000× 42 **or** 0.15 **or** 42000 o.e
	R2	Process to work with volume	1 or	L	34 × 22 × '0.15'(=112.2 m^3)**OR** '42 000' ÷ 350 (= 120m^2)
	A4	Full process to find figures to compare.	2 or	LM	34 × 22 × '0.15'(=112.2 m^3) **and '**42 000' ÷ 350 (= 120m^3)**OR** '112.2' × 350(=39270 kgs)
	I7	Correct decision from accurate figures	3	LMN	Yes **and** 39270 (kgs)**and** 42 000 (kgs) **OR** Yes **and** 39.27 (t) **OR**
Q6(b)	R3	Process to work out perimeter or total length of wood	1 or	P	6.5 + 3.8 + 6.5 + 3.8(=20.6) **OR** 8 × 2.4 (=19.2) **OR** 6.5 ÷ 2.4(=2.7...) and 3.8 ÷ 2.4(=1.58...)
	A4	Process to find number of pieces of wood. figures to compare.	2 or	PQ	'20.6' ÷ 2.4 (=8.583....)**OR** '20.6' ÷ 8(=2.575) **OR** 6.5 + 3.8 + 6.5 + 3.8(=20.6) **and** 8 × 2.4 (=19.2) **OR** 2.7 + 1.58 + 2.7 + 1.58 (=8.56)
	I6	Correct decision with figure	3	PQR	No **and** [8.5, 9] **OR** No **and**[2.5, 2.6] **OR** No and 20.6 and 19.2 OR No and 1.4 (m more needed)
Total marks for question			**7**		

Section C: Saving Water

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R1	Process to calculate difference	1 or	A	406 – 393 (=13) **OR** 0.05 × 393(=19.65) oe
	A4	Process to find figures to compare	2 or	AB	406 – 393 (=13) **and** 0.05 × 393(=19.65) **OR** **OR** 1.05 × 393(=412.65) **OR** 406 – '19.65'(= 386.35)
	I6	Correct decision from accurate figures to compare	3	ABC	No **AND** (£)13**and** (£) 19.65**OR** No **AND** 3.3(%) **OR** No **AND** (£)412.65**OR** No **AND** 386.35 **AND** 393 No **AND** under 5% by £6.65
Total marks for question			**3**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(a)	R2	Begins to substitute into formula or reverse substitution.	1 or	D	Calculates with two of 52 × 52 × 72 / 1275(=152.69...) **OR** 120 × 1275 (=153000)
	A4	Full process for substitution or finds figures to compare	2 or	DE	W= (= 152.69...) **OR** 120 × 1275 (= 153000) **and** 52 × 52 × 72 (=194688) **OR** (= 56.58..)(height) **OR** (= 2125) **and** 52^2(=2704) **OR** √'2125'(=46.097...) (diameter)
	I7	Correct decision with correct accurate figures	3	DEF	Yes **and [**152, 153] (litres)**OR** Yes **and [**56, 57] compared with 72 cm height **OR** Yes **and**[46,46.1] with 52 cm diameter
Q8(b)	R2	Begins to sketch cuboid	1 or	G	Sketch of cuboid or cube
	I6	Draws sketch showing lengths of sides.	2	GH	Sketch showing cuboid with sides 55 and 60 and height 50

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(c)	A4	Draws accurately using consistent units and scale **OR** Shows an inaccurate sketch showing 3 rectangles and their dimensions.	1	J	Draws 1 rectangle 6×5 **OR** 6×5.5 **OR** 5×5.5 **OR** Divides rectangle at least 3 rectangles which may not be accurately drawn. (may not use a ruler)
	R1	Begins to divide up rectangle.	2 or	JK	Draws at least: 1 rectangle 6 × 5.5 **AND** 2 rectangles 6 × 5 **or** 2 rectangles 5× 5.5 **OR** 1 rectangle of each size
	I6	Shows how 5 rectangles can be cut from plywood.	3	JKL	Draws 5 accurate rectangles: 2 rectangles 6×5 2 rectangles 5× 5.5 1 rectangle 6×5.5 Need not be joined
Total marks for question			**8**		

Question	Skills Standard	Process	Mark	Mark Grid	
Q9	R1	Process to find amount of water used in flushing or total cost	1 or	M	**OR** ⅓ × 9(=3) **OR** **OR** 1.87 × 81(=(£)151.47) Accept 0.33… not 0.3
	R2	Starts to find amount saved or spent on flushing	2 or	MN	'27' ÷ 9(=3)**OR** '27000'÷ 9(=3000)**OR** '151.47' ÷ 3(=50.49) **OR** '27' × 1.87(=50.49) Accept 0.33… not 0.3
	A4	Full process to find water saved or starts to process money	3 or	MNP	'3' × 2(=6) **OR** '3000' × 2(=6000)**OR** '50.49' ÷ 9(=5.61) **OR** '50.49' ÷ 9 × 7 (=39.27) '3000' × 7 (= 21000) **and** 21m^3 Accept 0.33… not 0.3
	A4	Full process to find money saved	4 or	MNP Q	'6' × 1.87(=11.22) **OR** '5.61' × 2(=11.22) **OR** '50.49' – '39.27'(=11.22) **OR** 27 – 21(=6) **and** 6 × 1.87(=11.22) Accept 0.33… not 0.3
	I7	Accurate saving in correct money notation.	5	MNP QR	£11.22 in correct money notation
Total marks for question			**5**		

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