Mark Scheme (Results)

June 2017

Functional Skills Mathematics Level 2

FSM02

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Guidance for Marking Functional Skills Maths 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 mark the working leading to the answer given in the answer box or working box. If there is no definitive answer then marks should be awarded for the 'lowest' scoring method shown.
- 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 his or her answer.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the functional demand of the 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 in a written paper); mark the better answer.
- **Incorrect method** if it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.
- **Follow through marks (ft)** 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 2.40£   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 **oe** 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
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in other parts of a question, even if not explicit in the expected part. E.g. checks in on earlier answer box.
- **Graphs**
  The mark schemes for most graph questions have this structure:

Process	Mark	Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph)	1 or	1 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	2 or	2 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	3	all of: linear scale(s), labels, accurate plotting (2 mm 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,** and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. Thus a graph that is 'fit for purpose' is one where 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. Candidate's scale must be in numerical order. Award the mark for plotting if you can read the values, even if the scale is not linear.
The mark schemes for **Data Collection and/ or summary 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.
Discuss any queries with your Team Leader.

Section A: Village festival

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R1	Begins to work with speed	1	A	1.2 ÷ 3 (=0.4) **OR** e.g. 3 (km) in 60 (mins) oe
	A4	Complete process to find journey time	1	B	'0.4' × 60 (=24) **OR** Full build up method (to 24 mins) oe
	R3	Full process to find finish time	1 or	C	11.45 + '24' (=12.09) oe
	I6	Correct answer	2	CD	12.09 accept any correct time notation
Q1(b)	A5	Relevant comment	1	E	e.g. timing will depend on traffic/congestion, traffic lights, crowds, weather, accident, slower or faster moving then predicted Accept any relevant comment that would affect the length of time for the journey

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(c)	I6	Find a missing length	1	F	$145 - 75$ (=70) **OR** $100 - 40$ (=60) May be indicated on the diagram
	R2	Begins process to find area	1 or	G	145×100 (=14500) **or** $75 \times$ '60' (=4500) **or** 145×40 (=5800) **or** 75×100 (=7500) **or** '60' $\times$ '70' (=4200) **or** $40 \times$ '70' (=2800)
	A4	Full process to find area of park	2	GH	'4500' + '5800' (=10300) **OR** '7500' + '2800' (=10300) **OR** '14500' − '4200' (=10300)
	R3	Process to work with visitor density	1 or	J	$10\,000 \div 0.9$ (=11 111.1..) **OR** '10300' $\times 0.9$ (=9270) **OR** '10300' $\div 10000$ (=1.03) **OR** $10000 \div$ '10300' (=0.97..) NB allow working with partial area e.g. $10\,000 \div 5800$
	I7	Correct conclusion with accurate figures	2	JK	No **and** 10300 **and** 11 111(.1..) (m^2) **OR** No **and** 9270 (visitors) **OR** No **and** 1.03 (m^2 per visitor) **OR** No **and** 0.97(actual visitors per m^2)
Q1(d)	A4	Complete process to work with fraction	1 or	L	$8.5(0) \div 5 \times 3$ (=5.10) oe
	I6	Accurate figure in correct money notation	2 or	LM	£5.10 in correct money notation isw
Total marks for question			**12**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R2	Finds price for Home Farm	1	N	7.8 + 7.8 (=15.60) oe
	A4	Begins to work with percentages	1 or	P	6.4×0.18 (=1.152) **OR** 6.4×3 (=19.2) **OR** $(100 - 18) \div 100$ (=0.82) oe NB calculating £3.456 is incorporated $6.4 \times 3 \times 0.18$
	A4	Full process to find price for Country Veg	2 or	PQ	$(6.4 - \text{‘}1.152\text{’}) \times 3$ (=15.744) oe **OR** $\text{‘}19.2\text{’} - (0.18 \times 19.2)$ (=15.744) oe **OR** $\text{‘}0.82\text{’} \times 6.4 \times 3$ (=15.744) oe
	I6	Correct conclusion with accurate figure	3	PQR	(Home Farm) (£)15.6(0) **AND** [15.7, 15.75]
Total marks for question			**4**		

Section B: History trip

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3(a)	I6	Works with fraction	1	A	500 ÷ 8 (=62.5) may be seen in subsequent working
	R2	Starts to engage with the problem	1 or	B	10.5 × 37 (=388.5) **OR** 350 ÷ 37 (=9.45…) **OR** 350 – '62.5' (=287.50)
	A4	Begins process to find total cost for trip or cost per student	2	BC	'388.5' + 350 (=738.5) **OR** 10.5 + '9.45' (=19.95..) **OR** '287.50' ÷ 37 (=7.77..) **OR** '691.5' – '388.5' (=303)
	R1	Develops solution	1 or	D	'738.5' – '62.5' (=676) oe **OR** '62.5' ÷ 37 (=1.68..) oe **OR** 17 × 37 (=629)
	A4	Full process to find figures to compare	2 or	DE	'676' ÷ 37 (=18.27..) **OR** '19.95' – '1.68' (=18.27..) **OR** '7.77…' + 10.50 (=18.27) **OR** '676' ÷ 17 (=39.76..) **OR** '629' + '62.5' (=691.5) **OR** 17 × 37 (=629) **and** '738.5' – '62.5' (=676)
	I7	Correct conclusion with accurate figures	3	DEF	No **and** (£)[18.27, 18.28] **OR** No **and** [39,40] (people) **OR** No **and** (£)691.5(0) **and** (£)738.5(0) **OR** No **and** (£)629 **and** (£)676 **OR** No **and** (£)303 (cost of bus they can afford) **or** (£)47 (short)

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3(b)	R2	Works out appropriate time for lunch	1	G	Start time for lunch between 12 pm and 1.15 pm and duration of 45 minutes, may be indicated by start time for 'walking to court'
	R3	Works out one time correctly	1	H	e.g. leave college 10 am – 40 (mins) (=9.20) **OR** leave court 4 pm – 50 (mins) (=3.10)
	A4	Develops time plan	1 or	J	Fully correct time plan with one error or omission (ignore lunch)
	I6	Fully correct time plan	2	JK	Appropriate times for all stages including Lunch – any 45-minute slot starting between 12 pm and 1.10 pm **AND** • students arrive at college at 8.55 am • coach leaves college at 9.20 am • arrive at museum at 10 am • spend at least one hour at museum • spend at least one hour at court • leave court at 3.10 pm • arrive at college at 4 pm • correct walking time implied or indicated See example at end of mark scheme
Total marks for question			**10**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	R3	Complete process to find mean	1 or	L	(3097 + 600 + 1138 +1594 + 1545 + 1338) ÷ 6 (=1552) **OR** 3097 + 600 + 1138 +1594 + 1545 + 1338 (=9312) **and** 6 × 1500 (=9000)
	I7	Correct conclusion with accurate figures	2	LM	E.g. Yes/No **and** 1552 Yes/No **and** 52 oe No **and** 9312 **and** 9000
	A5	Valid check	1	N	Valid check, e.g. reverse calculation, estimation or alternative method
Q4(b)	R2	Process to find increase as a fraction	1 or	P	3097 ÷ 19160 (=0.16163..)
	A4	Process to express as percentage of total	2	PQ	'0.16163…' × 100 (=16.163…)
	I6	Accurate figure to 1dp	1	R	16.2(%) Note must be to one decimal place Ft their calculated percentage
Total marks for question			**6**		

Section C: The artist

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Begins to substitute into formula	1 or	A	$1130 + 580$ (=1710) **OR** $2 \times 1130 + 2 \times 580$ (=3420) **OR** 4×420 (=1680) oe
	A4	Complete substitution	2	AB	$2 \times (1130 + 580) + 4 \times 420$ (=5100) oe
	R3	Uses consistent units	1	C	e.g. 1.13, 0.58, 0.42, 5.1, 4800, 0.3 may be seen in working
	I7	Correct conclusion with accurate figures	1	D	No **and** 5.1 (m) **OR** No **and** 4800 (mm) **and** 5100 (mm) oe
		Total marks for question	**4**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	I7	Starts to use conversion graph	1 or	E	E.g. vertical line drawn at 82 on horizontal axis allowing conversion reading **OR** appropriate points drawn, i.e. (82,7.4)
	I6	Correct answer	2	EF	[7.2, 7.6] (square metres)
Q6(b)	R2	Begins to work with ratio	1 or	G	4 + 3 + 1 (=8)
	A4	Full process to work with ratio	2 or	GH	$1.6 \div \text{'8'} \times 4$ (=0.8) oe **and** $1.6 \div \text{'8'} \times 3$ (=0.6) oe **OR** 0.8 (litres) red **OR** 0.6 (litres) blue **OR** 0.2 (litres) yellow
	I6	Communicates full solution with accurate figures	3	GHJ	0.8 (litres) red **and** 0.6 (litres) blue **and** 0.2 (litres) yellow oe
	A5	Valid check	1	K	Valid check, e.g. reverse calculation, estimation or alternative method **OR** 0.8 + 0.6 + 0.2 (=1.6)
Total marks for question			**6**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(a)	R1	Engages with scale	1 or	L	Rectangle 3 squares **and** 2.5 squares (in any orientation) **OR** Rectangle of any size (apart from 1 by 1) with all of: at least 3.5 squares above the floor at least 3 squares from the top
	A4	Begins to work with scale and constraints	2	LM	Rectangle 3 squares wide **and** 2.5 squares high with all of: at least 3.5 squares above the floor at least 3 squares from the top
	A4	Develops solution	1 or	N	Three same size rectangles with 3 of at least 3.5 squares above the floor at least 3 squares from the top different heights same distance between paintings – at least 1 square NB do not allow 1 by 1 rectangle
	I6	Fully correct solution	2	NP	Three correct size rectangles drawn with all of: at least 3.5 squares above the floor at least 3 squares from the top different heights same distance between paintings – at least 1 square
Q7(b)	A4	Full process to find figures to compare	1 or	Q	490 × 1.23 (=602.7) **OR** 600 ÷ 1.23 (=487.80..)
	I7	Correct conclusion with accurate figures	2	QR	No **and** ($)[602,603] **OR** No **and** (£)[487,488]
Total marks for question			**6**		

Example solution for question 3b

Students arrive at college	8.55 am
Coach leaves college	9.20 am
Arrive at museum	10.00 am
Have lunch	12.05 pm
Walk to court	12.50 pm
Arrive at court	1.05 pm
Leave court	3.10 pm
Arrive back at college	4 pm

Example solution for question 7a
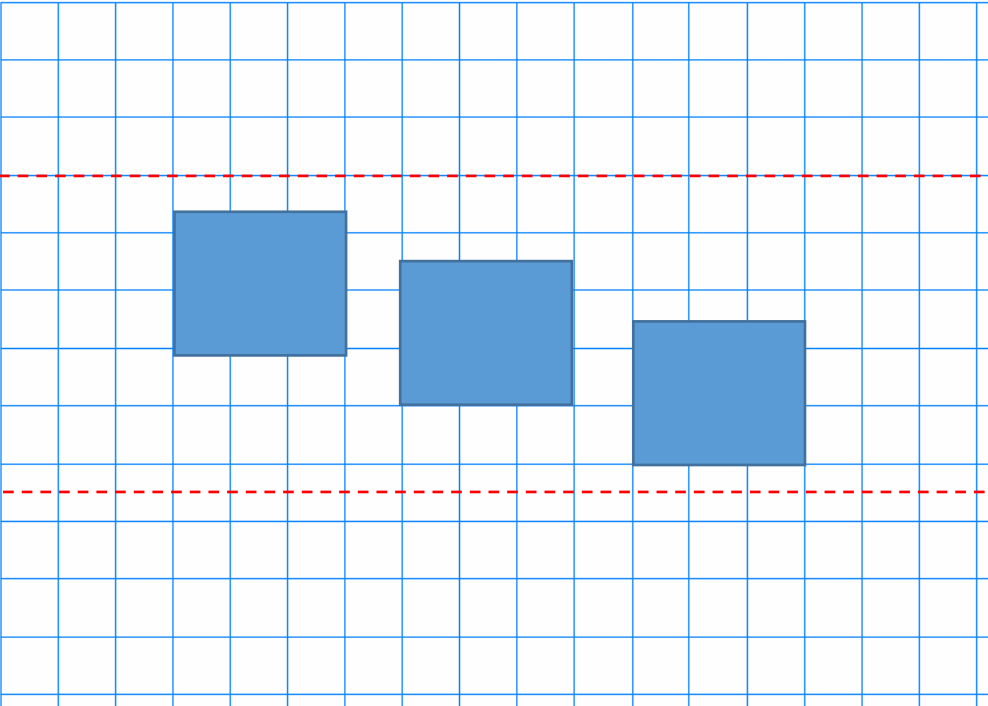
Ofqual

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