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Mark Scheme (Results)

June 2018

Functional Skills Mathematics Level 2

FSM02

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FUNCTIONAL SKILLS (MATHEMATICS)
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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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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.

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- **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.

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Section A: Advertising

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R3	Develops graph	1 or	A	One of • completes the linear scale on the *x*-axis • completes the linear scale on the *y*-axis • plots at least 3 points correctly • completes 2 linear scales correctly but omits upper value on one or both axes
	A4	Further develops graph	2 or	AB	Completes the linear scale on the *x*-axis **and** the *y*-axis **and** plots at least 2 points correctly **OR** Completes 1 linear scale correctly **and** plots all 5 points correctly **OR** Completes 2 linear scales correctly but omits upper value on one or both axes **and** plots 4 points correctly Tolerance ± 1 small square
	I6	Full process to complete the graph	3	ABC	Fully correct graph
Q1(b)	I7	Writes a suitable statement	1	D	e.g. positive correlation or the more posts the more likes
Q1(c)	R2	Works with mean	1 or	E	(2341 + 6310 + 3129 + 5128 + 4357) ÷ 5 (=4253) **OR** 4000 × 5 (=20000) **and** 2341 + 6310 + 3129 + 5128 + 4357 (=21265)
	I7	Valid decision with accurate figures	2	EF	Yes **AND** 4253 **OR** Yes **AND** 20000 **and** 21265
	A5	Valid check	1	G	Valid check, e.g. reverse calculation or alternative method
		Total marks for question	**7**		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(a)	R1	Accurate total number of first time customers	1	H	2800
	A4	Full process to find percentage	1 or	J	1634 ÷ '(731 + 435 + 1634)' × 100 (= 58.357…) Allow '(731 + 435 + 1634)' to be the sum of all the figures (13824) or the sum of all the new products (7252)
	I6	Accurate figure to 1 dp for their acceptable percentage calculation	2	JK	e.g. 58.4 (%) to 1 dp
Q2(b)	R2	Begins to work with ratio	1 or	L	e.g. 3 + 2 + 1 (=6) or 6 used **OR** 3 ÷ (3 + 2 + 1) (=0.5) oe **OR** 117 ÷ 3 (= 39) **OR** 117:78:39
	A4	Full process to find figures to compare	2 or	LM	e.g. 240 ÷ '6' × 3 (=120) oe **OR** 240 ÷ '6' (= 40) **and** 117 ÷ 3 (= 39) **OR** '39' × '6' (=234) **or** 117 × '2' (=234) oe **OR** 117:78:39 **and** 117 + 78 + 39 (=234) oe
	I7	Valid decision with accurate figure	3	LMN	e.g. No **AND** 120 **OR** No **AND** 40 **and** 39 **OR** No **AND** 234
		Total marks for question	**6**		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R3	Process to convert between currencies or work with 5 adverts	1 or	P	195 ÷ 1.1025 (= 176.87..) **OR** 195 × 5 (=975)
	A4	Full process to find total amount	2 or	PQ	'176.87' × 5 (=884.35..) **OR** '975' ÷ 1.1025 (=884.35..)
	I6	Accurate figure	3	PQR	(£) [884 , 885] Must not come from incorrect working
Total marks for question			**3**		

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Section B: Safari park

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	I6	Works with correct figures from the table	1	A	56 **and** 13.5 May be seen in a later calculation
	R3	Begins to work with percentages	1 or	B	e.g. 18 ÷ 100 × '56' (= 10.08) **OR** (100 – 18) ÷ 100 (=0.82) oe
	A4	Full process to work with percentages	2	BC	e.g. '56' – '10.08' (=45.92) **OR** 0.82 × '56' (= 45.92) oe Allow percentage discount with any figure in the table
	R2	Process to find total cost of tickets with or without discount or total discount for the correct number and category of people	1	D	e.g. '45.92' + '11.07' (=56.99) **OR** '56' + '13.50' (=69.5) **OR** '10.08' + '2.43' (=12.51)
	I6	Accurate figure in correct money notation	1	E	£56.99
Total marks for question			**5**		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R2	Begins to work with time	1	F	Shows a correct start and end time for at least 2 activities Safari (90 mins) e.g. 10.30am – 12.00pm Play park (20 mins) between 10.30am and 3.30pm Bird display (45 mins) either 11.30am – 12.15pm or 1.30pm – 2.15pm Wild trail (40 mins) between 10.30am and 3.30pm
	A4	Shows an appropriate time slot for lunch	1	G	Shows time for lunch between 12pm and 1pm **and** duration of 30 minutes
	A4	Develops time plan with intervals between activities	1	H	Shows two intervals of at least 10-minutes between activities
	I6	Fully correct time plan	1	J	Fully correct plan e.g. safari drive 10.30 – 12.00 Lunch 12.10 – 12.40 Play park 12.50 – 1.10pm Bird display 1.30pm – 2.15pm Wild trail 2 .25 – 3.05pm
Total marks for question			**4**		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R1	Full process to find cost	1 or	K	12.6 ÷ 3 × 2 (=8.4) oe
	I6	Accurate figure	2	KL	(£)8.4(0)
	A5	Valid check	1	M	Valid check, e.g. reverse calculation or alternative method
Total marks for question			**3**		

FUNCTIONAL SKILLS (MATHEMATICS)
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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R1	Begins to work with time or conversion	1 or	N	e.g. 65 ÷ 50 (=1.3) **OR** 4:45 – 3:30 (=75 mins) **OR** 50 (miles) in 60 (mins) oe **OR** 50 ÷ 60 (=0.83.. miles per min) **OR** 60 ÷ 50 (=1.2 mins per mile)
	A4	Develops solution	2 or	NP	e.g. '1.3' × 60 (=78) **OR** 65 ÷ 50 (=1.3) **and** 4:45 – 3:30 (=75 mins) **OR** 75 ÷ 60 (= 1.25) oe **OR** Full build up method to '78' mins **OR** 65 – 50 (=15 miles) **and** '75' – 60 (=15 mins) **OR** 65 ÷ '0.83..' (=78) oe
	R3	Full process to find figures to compare	3 or	NPQ	e.g. 3:30 + 78 mins (=4.48pm) **OR** 4:45 **—** 78 mins (= 3:27pm) **OR** 65 ÷ 50 (=1.3) **and** 75 ÷ 60 (= 1.25) **OR** 4:45 – 3:30 (=75) **and** '1.3' × 60 (=78) **or** 65 ÷ '0.83..' (=78) **OR** '1.25' × 50 (=62.5) oe **OR** 65 ÷ '1.25' (=52) **OR** (65 – 50) **÷** ('75' – 60) × 60
	I7	Valid decision with accurate figures	4	NPQR	e.g. No **AND** 4:48 (pm) **OR** No **AND** 3:27 (pm) **OR** No **AND** 3 mins difference oe **OR** No **AND** 1.3 (hr) **and** 1.25 (hr) **OR** No **AND** 75 (mins) **and** 78 (mins) **OR** No **AND** 62(.5) (miles) **OR** No **AND** 52 (mph) **OR** No **AND** 60 (mph) (for the last 15 miles)
Total marks for question			**4**		

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Section C: The park

<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 rowspan="3">Q8</td><td>R3</td><td>Begins designing a data collection sheet</td><td>1 or</td><td>A</td><td>Input opportunities and 3 of these overall headings
Play area (slides or climbing wall)
Water feature (lake or fountain)
Garden (roses or trees)
Visits (0-1, 2-5, 6 or more)</td></tr>
<tr><td>A4</td><td>Develops solution</td><td>2 or</td><td>AB</td><td>Input opportunities and all of these headings:
(Play area) slides, climbing wall
(Water feature) lake, fountain
(Garden) roses, trees
(Visits) 0-1, 2-5, 6 or more
May not be efficient, may be a questionnaire</td></tr>
<tr><td>I6</td><td>Fully correct and efficient data collection sheet</td><td>3</td><td>ABC</td><td>Efficient input opportunities and headings for all of:
(Play area) slides, climbing wall
(Water feature) lake, fountain
(Garden) roses, trees
(Visits) 0-1, 2-5, 6 or more
e.g.
<table>
<tr><th></th><th colspan="2">Play</th><th colspan="2">Water</th><th colspan="2">Garden</th></tr>
<tr><th></th><th>s</th><th>c</th><th>l</th><th>f</th><th>r</th><th>t</th></tr>
<tr><td>0 to 1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2 to 5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6+</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td colspan="3">Total marks for question</td><td colspan="3">3</td></tr>
</table>

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R1	Finds the radius of either the lake or the lake and path	1	D	95 ÷ 2 (= 47.5) **OR** (95 + 4 + 4) ÷ 2 (= 51.5)
	I6	Process to square correctly	1 or	E	'47.5' × '47.5' (= 2256.25) **OR** '51.5' × '51.5' (= 2652.25) Condone use of 95, 99 **or** 103
	R3	Full process to work with formula for one area	2 or	EF	3.14 × '47.5'² (= 7084.625) **OR** 3.14 × '51.5'² (= 8328.065) Condone use of 95, 99 **or** 103 Allow use of rounded figure of pi, 3.14 or better
	A4	Full process to find the area of the path	3 or	EFG	e.g. '8328.065' – '7084.625' (= 1243.44) **or** '8332.289..' – '7088.218..' (=1244.07..) **OR** 3.14 × 103² – 3.14 × 95² (=4973.76) Allow use of rounded figure of pi, 3.14 or better
	I6	Accurate figure with units	4	EFGH	e.g. 1243(.44) m² **OR** 1244(.07) m² Allow use of rounded figure of pi, 3.14 or better
Total marks for question			**5**		

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q10(a)	R1	Begins to work with scale	1 or	J	Draws a rectangle 4.5 squares by 2 squares **OR** Identifies area where tables cannot be placed, 1 square away from hedge **and** 2 squares away from entrance **OR** Draws 3 identical rectangles all with one correct dimension **and** all with at least one of: • at least 1 square away from hedge • at least 2 squares away from entrance • at least 2.5 squares away from each other
	A4	Develops working with constraints and uses scale	2 or	JK	Draws at least 2 rectangles all 4.5 squares by 2 squares **and** at least 2 of: • all rectangles at least 1 square away from hedge • all rectangles at least 2 squares away from entrance • all rectangles at least 2.5 squares away from each other
	I6	Fully correct diagram	3	JKL	Draws 3 rectangles all 4.5 squares by 2 squares **and** all of: • all rectangles at least 1 square away from hedge • all rectangles at least 2 squares away from entrance • all rectangles at least 2.5 squares away from each other See example of a correct solution below

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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q10(b)	A4	Works with consistent units	1	M	e.g. 80 or 180 or 0.12 oe May be used in subsequent calculations
	R1	Works with volume	1	N	0.8 × 1.8 × '0.12' (= 0.1728) oe May be used or implied in subsequent calculations
	A4	Full process to find figures to compare	1 or	P	e.g. '0.1728' × 3 (= 0.5184) oe **OR** 0.5 ÷ 3 (= 0.1666) **OR** 0.5 ÷ '0.1728' (= 2.89..) oe
	I6	Valid decision with accurate figures	2	PQ	No **AND** 0.51(84 m^3) **OR** No **AND** 0.17(28 m^3) **and** 0.16(66 m^3) **OR** No **AND** 2(.89.. bases)
Q10(c)	A5	Evaluative statement	1	R	e.g. yes he only doubled 1 length
		Total marks for question	**8**		

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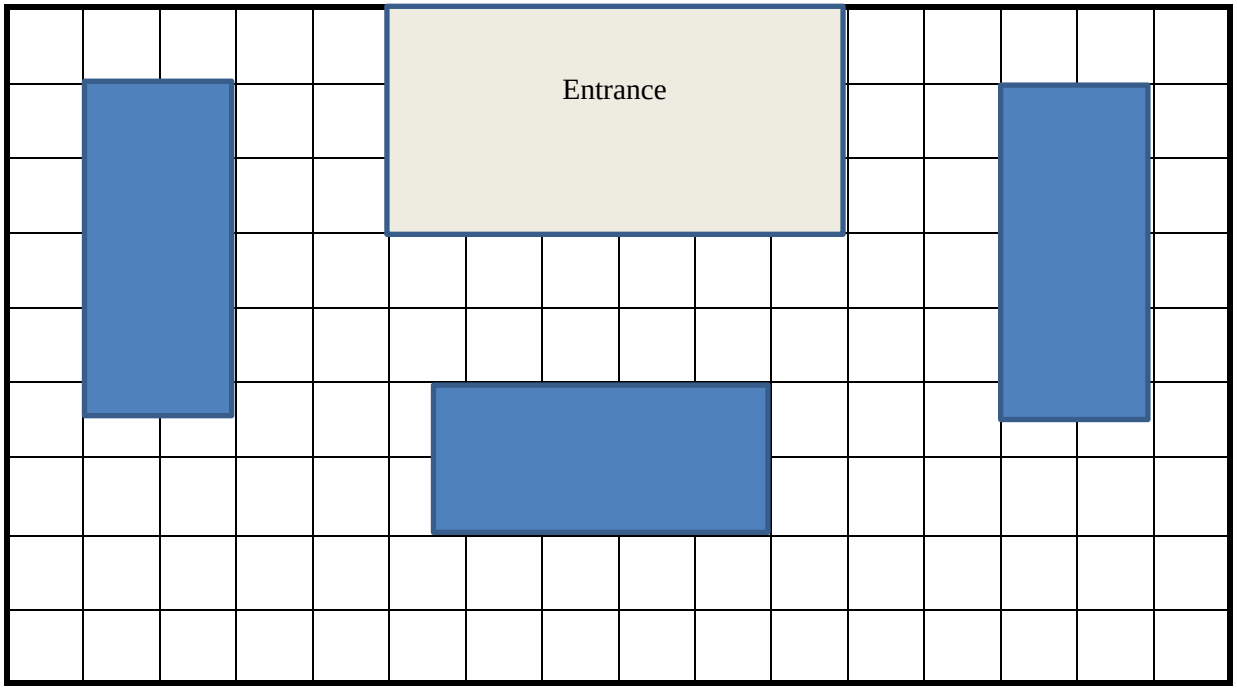
Q10a Example of fully correct diagram



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