

Mark Scheme (Results)

May 2016

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 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 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 $£12 \div 5$,
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 **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 (2 mm tolerance)
	2 or	2 of: linear scale(s), labels, plotting (2 mm tolerance)
	3	all of: linear scale(s), labels, 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**, 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. Candidate's scale must be in numerical order. 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: Growing vegetables

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R3	Full process to work with mean	1 or	A	$(3.61 + 3.48 + 4.05 + 3.79 + 3.51 + 3.59 + 3.68) \div 7 (=3.67..)$ OR $(3.61 + 3.48 + 4.05 + 3.79 + 3.51 + 3.59 + 3.68 (=25.71)$ and $3.6 \times 7(=25.2)$
	I7	Correct conclusion with accurate figures	2	AB	Yes AND [3.67, 3.7] (kg) OR Yes AND 25.7/(1) and 25.2 (kg)
	A5	Valid check	1	C	Valid check, e.g. alternative method or reverse calculation
Q1(b)	I6	Interprets diagram to identify fraction	1	D	$\frac{3}{5}$ oe (may be seen in calculation) OR $400 \div 5 (=80)$
	R2	Full process to find $\frac{3}{5}$ of 400 or total amount of water needed for 4 days	1 or	E	$400 \div '5 \times 3' (=240)$ ft. any proper non-unit fraction for this mark only OR $28 \times 2 \times 4 (=224)$
	A4	Full process to find figures to compare	2 or	EF	$400 \div '5 \times 3' (=240)$ and $28 \times 2 \times 4 (=224)$ OR $400 \div '5 \times 3' \div 4 (=60)$ and $28 \times 2 (=56)$ OR $'240' \div (28 \times 2) (=4.28..)$ OR $'240' \div 28 (=8.57..)$ and $2 \times 4 (=8)$ OR $'224' \div 3 \times 5 (=373.3..)$ (award mark D if this process seen)
	I7	Correct conclusion with accurate figures	3	EFG	Yes AND 224 and 240 (litres) OR Yes AND 60 and 56 (litres) OR Yes AND 4.2(8..)(days) OR Yes AND 8.5(7..) and 8 OR Yes AND 373(3..) (litres)(max tank needed)
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R1	Starts to work with ratio	1	H	$40 \div (5 + 3 + 1) (= 4.4..)$ OR $3/9$ seen OR $'18' \div 9 (=2)$ OR $4.8 \div 3 (=1.6)$
	R2	Begins the process to find figures to compare or converts units	1 or	J	$40 \div '9' \times 3 (=13.33..)$ OR $4.8 \div 0.45 (=10.66..)$ OR $40 \times 0.45 (=18)$ OR $'4.4..' \times 0.45 (=2)$ OR $5 \times '1.6' + 4.8 + '1.6' (=14.4)$
	A4	Full process to find figures to compare	2 or	JK	$'13.33..' \times 0.45 (=6)$ OR $'2' \times 3 (=6)$ OR $40 \div '9' \times 3 (=13.33..)$ and $4.8 \div 0.45 (=10.66..)$ OR $40 \times 0.45 (=18)$ AND $'18' - '14.4' (=3.6)$ OR $'14.4' \div 0.45 (=32)$ AND $40 - '32' (=8)$
	A4	Full process to find missing weight	3	JKL	$'6' - 4.8 (=1.2)$ OR $'13.33..' - '10.66..' (=2.66..)$ OR $'3.6' \div 9 \times 3 (=1.2)$ OR $'8' \div 9 \times 3 (=2.66..)$
	I6	Correct answer with units	1	M	1.2 kg OR [2.6, 2.7] lb or 2 lb 10 oz or 2 lb 11 oz (units required)
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3(a)	R2	Begins working with constraints and engages with the scale	1 or	N	Rectangle (covering more than 6 sq) positioned with a path at least 3 sq around it OR Rectangle covering between 5 and 6 sq and a path at least 1.5 sq around it
	A4	Engages correctly with the area and the scale	2 or	NP	Rectangle covering between 20 and 24 sq on the grid
	I6	Fully correct answer	3	NPQ	Rectangle covering between 20 and 24 sq (for the lettuce) and at least 3 squares space around it (for a path) and not over any feature
Q3(b)	A5	Evaluates the answer	1	R	E.g. I placed the space for lettuce 2 m away from the gate/water tank to allow easy entry/access
Total marks for question			4		

Section B: Carpentry company

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	R3	Full process to find total price before VAT or VAT on individual item	1 or	A	$3 \times 20.92 + 4(=66.76)$ OR $20.92 \times 1.2(=25.104)$ oe OR $4 \times 1.2(=4.8)$ oe OR $3 \times 20.92 \times 1.2(=75.312)$ oe
	A4	Full process to find total price with VAT	2 or	AB	$'66.76' \times 1.2(=80.112)$ oe OR $3 \times '25.10..' + '4.8'(=80.112)$ oe OR $('66.76' + 3.99) \times 1.2(=84.9)$ oe
	A4	Full process to find the total price	3	ABC	$'80.112' + 3.99(=84.102)$ oe
	I7	Correct answer	1	D	£84.10 or £84.11 in correct money notation Allow £84.90

Question	Skills Standard	Process	Mark	Mark Grid	Evidence															
Q4(b)	R1	Begins to interpret information	1 or	E	At least one door assigned to C, S and V in this order with correct start times and end times (may be implied by the start time of the next activity) OR All 3 doors assigned to cutting correctly															
	I6	Links times with activities for at least 2 doors or 2 activities for all 3 doors	2 or	EF	Correct start times and end times (may be implied by the start time of the next activity) for 2 doors for C, S and V (no overlap) OR 2 activities correctly assigned for 3 doors															
	A5	Fully correct time plan	3	EFG	<p>Fully correct time plan with all 3 doors assigned to C, S, V with correct times, starting at or after 8 am and finishing by 4 pm, without overlap in C and no more than 2 simultaneous S and V occurring (breaks between each stage are allowed)</p> <p>Example of fully correct answer:</p> <table border="1"> <thead> <tr> <th></th> <th>Door 1</th> <th>Door 2</th> <th>Door 3</th> </tr> </thead> <tbody> <tr> <td>C</td> <td>8.00 – 8.45</td> <td>8.45 – 9.30</td> <td>9.30 – 10.15</td> </tr> <tr> <td>S</td> <td>8.45 – 9.45</td> <td>9.30 – 10.30</td> <td>10.15 – 11.15</td> </tr> <tr> <td>V</td> <td>9.45 – 12.15</td> <td>10.30 – 13.00</td> <td>12.15 – 14.45</td> </tr> </tbody> </table>		Door 1	Door 2	Door 3	C	8.00 – 8.45	8.45 – 9.30	9.30 – 10.15	S	8.45 – 9.45	9.30 – 10.30	10.15 – 11.15	V	9.45 – 12.15	10.30 – 13.00
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V	9.45 – 12.15	10.30 – 13.00	12.15 – 14.45																	
Total marks for question			7																	

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	I6	Process to find number of large and small panels needed	1	H	$3 \times 6 (=18)$ or $4 \times 6 (=24)$ Can be seen in subsequent calculations
	R1	Begins to fit panels on a board or begins area method	1 or	J	$2400 \div 600 (=4)$ or $2000 \div 600 (=3.33..)$ OR $2400 \div 2130(=1.12..)$ or $2000 \div 600 (=3.33..)$ Allow area method $2400 \times 2000 (=4\ 800\ 000)$ or $2130 \times 600(= 1\ 278\ 000)$ or $600 \times 600 (= 360\ 000)$
	A4	Process to find the number of panels (small or large) on one board or finds total area of all boards or total area of one panel type per wardrobe	2 or	JK	'4' \times '3' (=12) (may be indicated on a diagram) OR '1' \times '3' (=3) (may be indicated on a diagram) Allow area method $10 \times '4\ 800\ 000'$ (=48 000 000) or '3' \times '360 000' (=1 080 000) or '4' \times '1 278 000' (=5 112 000)
	R2	Full process to find number of boards needed for each panel or full area method	3	JKL	'18' \div '12' (=1.5) or '24' \div 3 (=8) OR '18' - '12' (=6) May be indicated by multiple diagrams or a statement Allow area method '48 000 000' and '18' \times '360 000' + '24' \times '1 278 000' (= 37 152 000) oe If L mark awarded, award H mark
	A4	Full process to find number of boards needed	1 or	M	'1.5' + '8' (=9.5) or '2' + '8' (=10)
	I7	Correct conclusion with supporting evidence	2	MN	Yes AND 9.5 or 10 (must come from working) OR Full narrative explaining how 18 small and 24 large panels can fit onto 10 boards, e.g. 8 boards for large panels (3 each), 2 boards for small panels (18) NB Other combinations are possible and should be awarded appropriately if seen
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R2	Begins the graph	1 or	P	One of: Linear scale, full labels, plotting at least one year's set of data
	I6	Improves their answer	2 or	PQ	Two of: Linear scale, full labels, plotting at least one year's set of data
	A4	Correct graph or chart	3	PQR	Fully correct and labelled graph NB Minimum labelling required (20)14, (20)15, (Q)1, (Q)2, (Q)3, (Q)4, £ or profit (can be seen in title) Allow 2 mm plotting tolerance
Total marks for question			3		

Section C: Hotel

Question	Skills Standard	Process	Mark	Mark Grid	Evidence																								
Q7	I6	Begins to design summary table	1 or	A	Input opportunities AND headings for at least 2 of: UK/abroad (accept U/A) excellent/good/poor (accept E/G/P) under 3 (days) and 3(days) and more (accept < 3 and 3 +)																								
	R1	Improves their summary table	2 or	AB	Input opportunities AND headings for all: UK/abroad (accept U/A) excellent/good/poor (accept E/G/P) under 3 (days) and 3(days) and more (accept < 3 and 3 +) (may not be efficient- could be a questionnaire or suitable for 1 persons input)																								
	A4	Efficient summary two way table	3	ABC	Efficient summary two way table with efficient input opportunities.																								
	R2	Begins populating their table with totals	1 or	D	Completes their table with at least 8 entries correctly OR finds total for all the categories of rating and UK and abroad i.e. 9E, 7G, 2P and 11UK, 7A OR finds total for both lengths of stay i.e. 6 (people) under 3 days and 12 (people) 3 days or more																								
	I6	Efficient table(s) with correct figures for all 12 cells	2	DE	Fully correct answer, e.g. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th colspan="2"><i>UK</i></th> <th colspan="2"><i>Abroad</i></th> </tr> <tr> <th><i>Rating</i></th> <th><i><3 days</i></th> <th><i>3+ days</i></th> <th><i><3 days</i></th> <th><i>3+ days</i></th> </tr> </thead> <tbody> <tr> <td>E</td> <td>3</td> <td>2</td> <td>1</td> <td>3</td> </tr> <tr> <td>G</td> <td>1</td> <td>4</td> <td>0</td> <td>2</td> </tr> <tr> <td>P</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>		<i>UK</i>		<i>Abroad</i>		<i>Rating</i>	<i><3 days</i>	<i>3+ days</i>	<i><3 days</i>	<i>3+ days</i>	E	3	2	1	3	G	1	4	0	2	P	0	1	1
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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(a)	A4	Converts between currency	1	F	E.g. $126.07 \div 1.3203 (=95.485..)$ OR $15 \times 1.3203 (=19.8045)$ OR $750 \div 1.3203 (=568.05..)$ May be seen in later calculation
	R3	Engages with 5 days	1 or	G	'95.485..' $\times 5 (=477.429..)$ OR $126.07 \times 5 (=630.35)$ OR $5 \times 15 (=75)$ OR $5 \times '19.8045' (=99.0225)$
	A4	Full process to find figures to compare	2 or	GH	'630.35 + $5 \times '19.8045' (=729.3725)$ oe OR '477.429..' + '75' (=552.429..) and $750 \div 1.3203 (=568.05..)$
	I7	Correct decision with accurate figures	3	GHJ	Yes AND [729.35, 729.40] or 730 (euros) OR Yes AND (£)[552.40, 552.45] and (£)[568.05, 568.06] OR Yes AND figures to suitable accuracy from correct working
Q8(b)	R3	Process to find 1/3 of the 6 hours canoe rental	1 or	K	$35.5 \div 3 (=11.833..)$ oe
	A4	Full process to find price with the discount	2	KL	$35.5 \div 3 \times 2 (=23.66..)$ oe
	I7	Correct answer with valid figures	1	M	(£)23.66 or (£)23.67 Allow use of 0.333 or 0.666 or better
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R3	Substitutes in the formula	1 or	N	$55 \times 80 + 72.99 \times 6 (=4837.94)$
	A4	Full process to use the formula	2 or	NP	$1.2 \times (55 \times 80 + 72.99 \times 6)(=5805.528)$
	I6	Accurate figure	3	NPQ	(£)5805.52 or (£)5805.53
	A5	Valid check	1	R	Valid check e.g. reverse calculation or estimation
Total marks for question			4		

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Welsh Assembly Government

