

# Mark Scheme (Results)

May 2014

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 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  $£12 \div 5$ ,
      - 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, )	<b>1</b>	1 of
	<b>or</b>	linear scale(s), labels, plotting (2mm tolerance)
	<b>2</b>	2 of
	<b>or</b>	linear scale(s), labels, plotting (2mm tolerance)
	<b>3</b>	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: Cars**

<b>Question</b>	<b>Skills Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Mark Grid</b>	<b>Evidence</b>
<b>Q1(a)</b>	I7	Reads value correctly from graph	1	A	(£)4600 Allow $\pm 100$
<b>Q1(b)</b>	R2	Starts to work with mean	1 or	B	$10\,000 \div 12 (=833.3\dots)$ <b>OR</b> $830 \times 12 (=9960)$
	I7	Correct conclusion with accurate figures	2	BC	E.g. Yes and 833.3....(miles) <b>OR</b> Yes 9960 (miles) is less than 10 000 (miles) <b>OR</b> He can as only does 9960
	A5	Shows a suitable check	1	D	Shows a reverse check of working or alternative method or checks their answer e.g. $10\,000 - 9960 = 40$
<b>Total marks for question</b>			<b>4</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(a)	R1	Begins to produce data collection sheet	1 or	E	Input opportunities <b>AND</b> Headings for at least 2 of: car <b>or</b> labels for each car, automatic/manual, petrol/diesel <b>or</b> fuel type, mileage  Accept individual sheet with at least 2 of: car <b>or</b> labels for each car, automatic/manual, petrol/diesel <b>or</b> fuel type, mileage
	R2	Improves data collection sheet	2 or	EF	Input opportunities <b>AND</b> all of: car <b>or</b> labels for each car, automatic/manual, petrol/diesel <b>or</b> fuel type, mileage but <b>not</b> an efficient table <b>OR</b>  Input opportunities <b>AND</b> 2 of: car or labels for each car, automatic/manual, petrol/diesel <b>or</b> fuel type, mileage in an efficient table  Accept individual sheet with all of: car <b>or</b> labels for each car, automatic/manual, petrol/diesel <b>or</b> fuel type, mileage
	I6	Fully correct and efficient data sheet	3	EFG	Data collection sheet deals with all categories in a table <b>AND</b> with clear <b>efficient</b> input opportunities for at least 5 cars



Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(b)	R2	Identifies costs for one car and works with total or difference or finds costs of car and running costs for both cars	1 or	H	6995 + 175 + 1420 (=8590) <b>OR</b> 8995 + 30 + 1160 (=10185) <b>OR</b> 8995 – 6995 (= 2000) <b>OR</b> 175 – 30 (=145) <b>OR</b> 1420 – 1160 (=260) <b>OR</b> (8995 + 1160) – (6995 + 1420) (=1740) (ignoring tax) Allow use of 12 × tax
	A4	Complete process to find difference in costs for both cars	2	HJ	‘10185’ – ‘8590’ (=1595) oe <b>OR</b> ‘2000’ – ‘145’ – ‘260’ (=1595) oe <b>OR</b> Allow use of 12 × tax
	I7	Correct conclusion from their accurate processes	1	K	(£) 1595 <b>from accurate calculation AND</b> affirmative statement
<b>Total marks for question</b>			<b>6</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3(a)	I7	Correct conclusion and clear explanation that $-12(^{\circ}\text{C})$ is warmer than $-36.6(^{\circ}\text{C})$	1	L	E.g. Yes <b>and</b> $-12(^{\circ}\text{C})$ is higher/warmer than $-36.6(^{\circ}\text{C})$ <b>OR</b> the temperature can drop another 24(.6 degrees)
Q3(b)	R1	Converts to common units or works with fuel consumption	1 or	M	$131.7 \times 4.5 (=592.65)$ (p per gallon) oe <b>OR</b> $44.8 \div 4.5(=9.955..)$ (miles per litre) <b>OR</b> $6000 \div 44.8 (=133.9\dots)$ (gallons per year) <b>OR</b> $4.5 \div 44.8 (=0.1\dots)$ (litres per mile)
	R2	Coordinates features	2 or	MN	$6000 \div 44.8 (=133.9\dots)$ <b>and</b> $131.7 \times 4.5 (=592.65)$ <b>OR</b> $6000 \div '9.955..' (=602.6 \dots)$ (litres per year) <b>OR</b> $'133.9..' \times 4.5 (=602.55)$ <b>OR</b> $'0,10\dots' \times 6000 (=602.6\dots)$
	A4	Process to find fuel costs for one year	3	MNP	$'133.9' \times '592.65' (=79372.7\dots)$ oe <b>OR</b> $'602.55' \times 131.7 (=79355.8\dots)$ oe <b>OR</b> $134 \times '592.65' (=79415.1)$ <b>OR</b> $134 \times 593 (=79462)$ <b>OR</b> $'602.6..' \times 131.7 (=79372.7\dots)$ oe
	A4	Finds correct fuel cost per year	1	Q	[79355, 79462] (p) <b>or</b> (£)[793, 795]
	I6	Correct answer in correct money notation	1	R	£800 Correct money notation, rounded correctly. Mark P must be awarded
<b>Total for question</b>			<b>6</b>		

**Section B: Community centre**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q4(a)</b>	R1	Starts to work with dates	1 or	A	19, 21, 25, 26, 28 with up to 2 errors or omissions <b>OR</b> 17, 19, 21, 23, 24, 25, 26, 28
	I6	Finds a correct answer	2	AB	All of: 19, 21, 25, 26, 28 <b>and</b> no other
<b>Q4(b)</b>	A4	Process to find a figure to compare	1 or	C	E.g. $900 \div [38, 40]$ (= [22.5, 23.6..]) <b>OR</b> $900 \div 25$ (=36) <b>OR</b> $[38, 40] \times 25$ (= [950, 1000]) Accept complete build-up methods
	I7	Valid decision with valid figures to compare	2	CD	E.g. Yes <b>AND</b> [22.5, 24] (mins) <b>OR</b> Yes <b>AND</b> 36 (words per min) <b>OR</b> Yes <b>AND</b> [950, 1000] (words)
<b>Total marks for question</b>			<b>4</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	I6	Draws diagram in correct configuration	1	E	Correct configuration
	R1	Starts to work with lengths and widths of playing spaces	1 or	F	Draws 2 playing spaces at least one labelled 17 by 7 <b>OR</b> 7 + 7 + 7(=21) <b>OR</b> 17 + 7(=24) <b>and</b> 7 + 7(=14)
	A4	Process to work with lengths and widths of 3 playing spaces	2	FG	Draws 3 playing spaces at least one labelled 17 by 7
	A5	Checks distances from walls	1 or	H	Draws 1 playing space labelled $\geq 2$ ft from walls <b>OR</b> 17 + 2 + 2(=21) <b>or</b> '21' + 2 + 2(=25) <b>OR</b> Available floor space 28 by 20
	I7	Complete arrangement of tables correctly placed	2	HJ	Draws 3 playing spaces with position labelled such that it is clear that there is a gap $\geq 2$ ft from walls, not overlapping Provided mark E is awarded NB Playing spaces may not be labelled or labelled incorrectly
<b>Total marks for question</b>			<b>5</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	R1	Starts to work with ratio	1	K	$3.5 + 400 (=403.5)$ <b>OR</b>
	A4	Full process to find figures to compare	1 or	L	E.g. $'403.5' \times 8 (=3228)$ <b>OR</b> $3228 \div 8 (=403.5)$ <b>OR</b> $3228 \div 403.5 (=8)$
	I7	Makes a valid decision with accurate calculated figures	2	LM	Yes <b>and</b> accurate calculated figures
Q6(b)	R2	Finds an unknown length and uses it in a calculation	1	N	84 <b>or</b> 82 <b>or</b> 52 <b>or</b> 50 used in a calculation
	A4	Process to find an area or to find the total length of path	1 or	P	E.g. $86 \times 54 (=4644)$ <b>OR</b> $'82' \times '50' (=4100)$ <b>OR</b> $86 \times 2 (=172)$ <b>OR</b> $'50' \times 2 (=100)$ <b>OR</b> $'82' \times 2 (=164)$ <b>OR</b> $54 \times 2 (=108)$ <b>OR</b> $'84' + '52' + '84' + '52' (=272)$
	A4	Full process to find area of path	2 or	PQ	$86 \times 54 - '82' \times '50' (=544)$ <b>OR</b> $'172' \times 2 (=344) + '100' \times 2 (=200) (=544)$ <b>OR</b> $'164' \times 2 (=328) + '108' \times 2 (=216) (=544)$ <b>OR</b> $'272' \times 2 (=544)$
	I6	Finds correct area	3	PQR	544 (m <sup>2</sup> )
<b>Total marks for question</b>			<b>7</b>		

**Section C: Police officer**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(a)	R2	Process to use common units	1	A	1000 (m) <b>OR</b> 0.7 (km) used in a calculation
	R3	Starts to use proportion	1 or	B	E.g. $1000 \div 5.5 (=181.8\dots)$ <b>OR</b> $0.7 \div 4 (=0.175)$ <b>OR</b> 500 (m) in 2.75 mins, 250 (m) in 1.375 mins, 50 (m) in 0.275 mins <b>OR</b> 1000 (m) in 5.5 mins, 100 (m) in 0.55 mins <b>OR</b> $1000 \div 5.5 (=181.8\dots \text{ m/min})$ <b>OR</b> $700 \div 4 (=175 \text{ m/min})$
	A4	Complete process to find figures to compare	2 or	BC	E.g. $'181.8..' \times 4 (=727.27..)$ <b>OR</b> $'0.175' \times 5.5 (=0.9625)$ <b>OR</b> $'2.75 + 1.375 - 0.275' (= 3.85)$ <b>OR</b> $'0.55' \times 7 (=3.85)$ <b>OR</b> $'0.7' \times 5.5 (=3.85)$ <b>OR</b> $1000 \div 5.5 (=181.8\dots \text{ m/min})$ <b>AND</b> $700 \div 4 (=175 \text{ m/min})$
	A4	Finds accurate figures to compare	3	BCD	E.g. [727,728](m) oe <b>OR</b> [0.96, 0.97](km) oe <b>OR</b> [3.8, 3.9] (mins) <b>or</b> [3 mins 48 secs, 3 mins 54 secs] <b>OR</b> [228, 234] (secs) <b>OR</b> 181.8.. (m/min) <b>and</b> 175 ( m/min)

<b>Q7(a) cont.d.</b>	I6	Draws correct conclusion, ft their figures provided B and C scored	1	E	Ft their figures if BC scored E.g. He can run more than 700 m in 4 mins <b>OR</b> In 5.5 mins he only needs to run 0.96 km <b>OR</b> It will only take him [3.8,3.9] mins to run 700 m <b>OR</b> He can run faster <b>and</b> 181.8... (m/min) <b>and</b> 175 (m/min)
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Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q7(b)</b>	A4	Converts imperial units	1	F	$6 \times 12 (=72)$ May be seen in subsequent calculation
	R1	Starts to work with formula	1 or	G	E.g. $182 \div '72'^2 (=0.035..)$ <b>OR</b> $[18.5, 25] \div 703 (= [0.026.., 0.035..])$ Condone $182 \div 36 (=5.05..)$
	A4	Full correct substitution with some evaluation in formula	2 or	GH	E.g. $(182 \div 5184) \times 703 (=24.6..)$ <b>OR</b> $[0.026.., 0.035..] \times '72'^2 (= [136, 185])$
	I6	Finds accurate figures to compare	3	GHJ	$[24.6, 24.7]$ (BMI) <b>OR</b> $[136, 185]$ pounds for his height
<b>Total marks for question</b>			<b>9</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(a)	R1	Correctly finds elapsed time	1	K	Finds one of: 0700 to 1500 = 8 hours 2100 to 0700 = 10 hours 1500 to 0100 = 10 hours
	A4	Full process to find total elapsed time or difference from 200	1 or	L	$8 \times 4 + 10 \times 4 + 10 \times 4 + 8 \times 4 + 10 \times 4 (=184)$ <b>OR</b> $200 - (8 \times 4 + 10 \times 4 + 10 \times 4 + 8 \times 4 + 10 \times 4) (=16)$ Condone use of 9 (for 8) and 11 (for 10) hours for this mark
	I7	Valid conclusion with accurate figures	2	LM	E.g. Not as many hours <b>AND</b> 184 (hours) <b>OR</b> 16 (hours) less  NB Calculations may be seen on table
Q8(b)	R2	Works with tax allowance	1	N	E.g. $19\ 000 - 10\ 000 (=9000)$ <b>OR</b> $22\ 000 - 10\ 000 (=12\ 000)$ <b>OR</b> $20\ 500 - 10\ 000 (=10\ 500)$
	R3	Starts to work with percentages	1 or	P	'9000' $\times 0.8$ oe (=7200) <b>OR</b> '12 000' $\times 0.8$ oe (=9600) <b>OR</b> '10 500' $\times 0.8$ oe (=8400)  Allow 0.8 of 19 000 <b>or</b> 22 000 oe (=15200 or 3800 or 17600 or 4400)



<b>Q8(b) cont.d.</b>	A4	Finds minimum weekly earnings after tax	2	PQ	E.g. (‘7200’ + 10 000) ÷ [48, 52] (= [330.76..., 358.33..]) <b>OR</b> (9600 + 10 000) ÷ [48, 52] (= [376.92..., 408.33...]) <b>OR</b> (8400 + 10 000) ÷ [48, 52] (= [353.84..., 383.33..]) N.B the full correct process must be seen
	I6	Correct decision with accurate figures	1	R	Yes <b>AND</b> (£)[330, 409] Must follow from correct process with mark Q awarded
<b>Total marks for question</b>			<b>7</b>		

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Rewarding Learning