

# Mark Scheme (Results)

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

<b>Question</b>	<b>Skills Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Mark Grid</b>	<b>Evidence</b>
<b>Q1a</b>	R1	Begins to process suitable graph or chart	1 or	A	<b>One</b> of: linear scale, plotting, labelling
	A4	Improves solution	2 or	AB	<b>Two</b> of: linear scale, plotting, labelling
	I6	Fully correct graph or chart	3	ABC	<b>All</b> of: linear scale, plotting, labelling (± 2 mm tolerance on plotting) Minimum acceptable labelling one axis or key reference to Jan to Mar, Apr to Jun, Jul to Sep, Oct to Dec <b>and</b> 2012, 2013 Other axis or title reference to crime (levels)
<b>Q1b</b>	I6	Makes an acceptable statement to compare the figures for the two years	1	D	Acceptable statements include: (Total) number of crimes in 2012 is higher than 2013 <b>OR</b> Number of crimes is higher in 2012 than 2013 for Jan to Sep but lower in 2012 than 2013 for Oct to Dec <b>OR</b> Number of crimes is highest in Apr to Jun in both years <b>OR</b> Number of crimes was highest in Apr to Jun of 2012 <b>and</b> number of crimes was lowest in Jul to Sep of 2013

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1c	R1	Full process for mean	1 or	E	$(514 + 563 + 494 + 505) \div 12 (=173)$ <b>OR</b> $514 + 563 + 494 + 505(=2076)$ <b>and</b> $173 \times 12(=2076)$ <b>OR</b> $(514 \div 3(=171.33..)) + 563 \div 3(=187.66..) + 494 \div 3(=164.66..) + 505 \div 3(=168.33..)$ <b>and</b> '[690, 694]' $\div 4 (= [172.5, 173.5])$ Allow $(514 + 563 + 494 + 505) \div 4(=519)$ for this mark only
	A4	Correct decision with correct figure	2	EF	Yes <b>and</b> 173 calculated <b>OR</b> [172.5, 173.5] <b>and</b> a suitable statement <b>OR</b> Yes <b>and</b> 2076 calculated both ways
	A5	Shows a check of their calculation or part of it	1	G	Eg reverse calculation or alternate method e.g. $173 \times 12 = 2076$ or allow $519 \times 4 = 2076$ or uses an estimation method e.g. $3 \times 500 + 550 = 2050$
<b>Total marks for question</b>			<b>7</b>		



Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R2	Process to work with proportion	1 or	H	$105000 \div 1000 (=105)$ <b>OR</b> $0.2153 \times 105000 (=22606.5)$ <b>OR</b> Digits 226065 seen Accept $0.578 \times 105000 (=60690)$ for this mark only
	A4	Process to find number of car crimes	2 or	HJ	$'105' \times 0.2153 (=22.6065)$ <b>OR</b> $'22606.5' \div 1000 (=22.6065)$
	I7	Accurate figure	3	HJK	[22, 23] (car crimes) <b>and</b> 22.6... seen
<b>Total marks for question</b>			<b>3</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3a	R2	Begins to process percentage or proportion	1 or	L	E.g. $100 - 80 (=20)$ <b>OR</b> $(2 \text{ in } 5) \times 100 (=40 \text{ in } 100)$ <b>OR</b> $1 - 2/5 (=3/5)$ <b>OR</b> 3 in 5 <b>OR</b> 4 in 5 <b>OR</b> $80 \div 100 (=0.8)$ Accept calculating for a number of people E.g $0.8 \times 300 (=240)$ <b>or</b> $(2 \text{ in } 5) \times 300 (=120)$
	A4	Process for figures to compare or writes a correct statement	2 or	LM	E.g. $20 \div 100 (=1/5)$ <b>OR</b> $100 - 80 (=20)$ <b>and</b> $2 \div 5 \times 100 (=40)$ <b>OR</b> $(3 \text{ in } 5) \times 100 (=60 \text{ in } 100)$ <b>OR</b> $80 \div 100 (=0.8)$ <b>and</b> $3 \div 5 (=0.6)$ <b>OR</b> $40\% + 80\% = 120\%$ <b>OR</b> Accept comparisons from calculating for a number of people E.g $0.8 \times 300 (=240)$ <b>and</b> $(2 \text{ in } 5) \times 300 (=120)$ E.g. 4 in 5 think there is at least as much crime as last year
	I6	Finds accurate figures in the same format	3	LMN	1 in 5 <b>OR</b> 20% <b>and</b> 40% <b>oe</b> <b>OR</b> 60% <b>OR</b> 4 in 5 <b>and</b> 3 in 5 <b>oe</b> <b>OR</b> $40\% + 80\% = 120\%$ when it should be 100% Accept comparisons from calculating for a number of people E.g 240 people <b>and</b> 120 people (for population of 300) Note comparisons must be made in the same format

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3b	R1	Begins to produce data collection sheet	1 or	P	Input opportunities <b>AND</b> headings for at least 2 of : male/female, age under 30 and 30 – 50 and over 50, feel safe/ feel unsafe <b>OR</b> a questionnaire with a missing category
	R2	Improves data collection sheet that is not yet efficient	2 or	PQ	Input opportunities, not all efficient, covering all of male/female, age under 30 and 30 – 50 and over 50, feel safe/feel unsafe One category could be covered by a key <b>OR</b> A questionnaire, or a sheet suitable for only 1 person's input, covering all categories
	I6	Fully correct efficient data collection sheet	3	PQR	Data collection sheet showing all categories with 12 cells for efficient input opportunities
<b>Total marks for question</b>			<b>6</b>		

**Section B: Building a games room**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R1	Starts to process costs	1 or	A	$12 \times 197 (=2364)$ <b>OR</b> $12 \times 84.49 (=1013.88)$ <b>OR</b> $2 \times 12 \times 197 (=4728)$ <b>OR</b> $5 \times 12 \times 84.49 (=5069.4)$ <b>OR</b> $2 \times 12 \times (197 - 84.49) (=2700.24)$ <b>OR</b> $3 \times 12 \times 84.49 (=3041.64)$
	A4	Process for difference in total cost	2 or	AB	$'5069.4' - '4728' (=341.4)$ <b>OR</b> $'3041.64' - '2700.24' (=341.4)$
	I6	Finds difference in cost and uses correct money notation	3	ABC	£341.40 correct money notation Ignore negative signs
<b>Total marks for question</b>			<b>3</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Considers space for snooker table	1 or	D	Rectangle with 2 of: Length 11 squares Width 8 squares At least 2 squares from media centre <b>OR</b> Rectangle 5.5 squares by 4 squares <b>and</b> at least 1 square from the media centre
	A4	Fully correct snooker table solution	2	DE	Rectangle with all of: Length 11 squares Width 8 squares At least 2 squares from media centre
	R1	Considers area for seating space	1 or	F	Rectangle with area 8, 16, 32 or 64 squares <b>OR</b> Rectangle with one side 4 or 8 or 16 squares and two squares from the snooker table
	I6	Fully correct checked seating space solution	2	FG	Rectangle 2 squares by 16 squares or 4 squares by 8 squares <b>and</b> 2 squares from snooker table
<b>Total marks for question</b>			<b>4</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q6</b>	R1	Uses % at John & Son	1 or	H	$0.2 \times 17.4(=3.48)$ <b>or</b> $1.2 \times 17.4(=20.88)$ oe
	A4	Finds cost at John & Son	2	HJ	(£)20.88
	R2	Uses fraction at King & Lye	1 or	K	$29.94 \div 3(=9.98)$ <b>or</b> $29.94 \div 3 \times 2(=19.96)$ <b>OR</b> $30 \div 3 \times 2(=20)$ <b>and</b> 20.88 <b>OR</b> Allow $0.33\dots \times 29.94$ ( $=[9.88, 9.98]$ ) Allow $[0.66, 0.67] \times 29.94$ ( $=[19.76, 20.06]$ )
	A4	Finds cost at King & Lye	2	KL	(£)19.96 <b>OR</b> Cost < (£)20 <b>and</b> (£)20.88
	I7	Makes correct ft decision provided marks H and K are awarded	1	M	Makes correct ft decision provided marks H and K are awarded for the full processes at both suppliers e.g. King & Lye
<b>Total marks for question</b>			<b>5</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R2	Process to find area of wall(s) or blocks per wall or blocks in 8 packs	1 or	N	$9 \times 2.2 (=19.8)$ <b>OR</b> $3 \times 9 \times 2.2 (=59.4)$ <b>OR</b> $10 \times 9 \times 2.2 (=198)$ <b>OR</b> $72 \times 8(=576)$
	A4	Process to find area covered by 8 packs or number of blocks needed or works with <b>both</b> area one wall and blocks in 8 packs	2 or	NP	'576' $\div$ 10(=57.6) <b>OR</b> '59.4' $\times$ 10(=594) <b>OR</b> '198' $\times$ 3(=594) <b>OR</b> $10 \times 9 \times 2.2 (=198)$ <b>and</b> $72 \times 8(=576)$ <b>OR</b> '198' $\div$ 72 (=2.75) <b>OR</b> '198' $\div$ 8 (=24.75)
	A4	Full process to find figures to compare	3 or	NPQ	'594' $\div$ 72(=8.25) <b>OR</b> '59.4' $\times$ 10(=594) <b>and</b> $72 \times 8(=576)$ <b>OR</b> '198' $\times$ 3(=594) <b>and</b> $72 \times 8(=576)$ <b>OR</b> $3 \times 9 \times 2.2(=59.4)$ <b>and</b> '576' $\div$ 10(=57.6) <b>OR</b> $9 \times 2.2(=19.8)$ <b>and</b> '57.6' $\div$ 3(=19.2) <b>OR</b> ( '57.6' $\div$ 3) $\div$ 9(=2.13..) <b>OR</b> ( '57.6' $\div$ 3) $\div$ 2.2(=8.7..)
	I7	Valid conclusion and accurate figures	4	NPQR	E.g. No <b>and</b> 8.2(5) (packs) <b>OR</b> He needs 9 packs <b>and</b> 8.2(5) <b>OR</b> No <b>and</b> 594 (blocks) <b>and</b> 576 (blocks) <b>OR</b> No <b>and</b> 59.4 (m <sup>2</sup> ) <b>and</b> 57.6 (m <sup>2</sup> ) <b>OR</b> No <b>and</b> 19.8(m <sup>2</sup> ) <b>and</b> 19.2(m <sup>2</sup> ) <b>OR</b> No <b>and</b> 2.13... <b>and</b> explicit comparison with 2.2 <b>OR</b> No <b>and</b> 8.7.. <b>and</b> explicit comparison with 9
<b>Total marks for question</b>			<b>4</b>		

**Section C: Dog walking**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q8a</b>	R1	Process to calculate cost per week before discount or amount per day available	1	A	$5 \times (10+6) (= 80)$ <b>OR</b> $70 \div 5(=14)$ Allow $7 \times (10+6) (= 112)$
	R2	Process to find percentage	1 or	B	E.g. $0.15 \times '80'(=12)$ <b>OR</b> $0.15 \times '16'(=2.4)$ <b>OR</b> $0.15 \times$ any relevant figure <b>OR</b> $0.85 \times$ any relevant figure <b>OR</b> $70 \div 0.85(=82.35..)$
	A4	Process for figures to compare	2 or	BC	$0.85 \times '80'(=68)$ <b>OR</b> $'80' - '12'(=68)$ <b>OR</b> $'14' \div 0.85(=16.47...)$ <b>OR</b> $'16' - '2.4'(=13.6)$ <b>and</b> $70 \div 5(=14)$ <b>OR</b> $'16' - '2.4'(=13.6)$ <b>and</b> $'13.6' \times 5(=68)$
	I7	Valid decision from accurate figures	3	BCD	Yes <b>and</b> (£)68 <b>OR</b> Yes <b>and</b> (£)16 <b>and</b> (£)16.47 <b>OR</b> Yes <b>and</b> (£)13.6 <b>and</b> (£)14 <b>OR</b> Yes <b>and</b> (£)82.35.. <b>and</b> (£)80
<b>Total marks for question</b>			<b>4</b>		



Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8b	R1	Begins to substitute or to reverse process	1 or	E	28(10-7) + 144 <b>OR</b> 28 × 3(=84) <b>OR</b> 250 - 144(=106)
	A4	Completes process	2 or	EF	'84' + 144(=228) <b>OR</b> ( '106' ÷ 28) + 7(=10.7....) <b>OR</b> 28 × 3(=84) <b>and</b> 250 - 144(=106) <b>OR</b> '106' ÷ 28(=3.7....)
	I7	Valid decision and accurate figures	3	EFG	Yes <b>and</b> (£)228 <b>OR</b> Yes <b>and</b> [10.7, 10.8] <b>OR</b> Allow, with full calculation: Yes <b>and</b> (£)84 <b>and</b> (£)106 <b>OR</b> Yes <b>and</b> [3.7, 3.8] <b>and</b> 3
<b>Total marks for question</b>			<b>3</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R2	Begins to consider constraints	1 or	H	<b>NB</b> Correct booking is correct location and correct days and correct number of days and no double booking Correctly books any 2 dogs
	I6	Develops solution	2 or	HJ	Correctly books 2 dogs, at least one of which is Meg <b>or</b> Toby <b>or</b> Sadie <b>or</b> Chip <b>OR</b> Correctly books 3 of Sam, Rex, Winston, Molly
	A5	Checks & improves solution	3 or	HJK	Correctly books 4 dogs, at least two of which are Meg <b>or</b> Toby <b>or</b> Sadie <b>or</b> Chip
	I6	Fully correct optimal solution considering all criteria	4	HJKL	Fully correct optimal solution (19 dog walks correctly booked) and no additional incorrect bookings Allow dogs to move across rows in correct location. See solutions at end of mark scheme
<b>Total marks for question</b>			<b>4</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q10</b>	R2	Begins to process time in locations	1 or	M	Shows start and finish time for at least <b>2</b> of: Home, Burton coffee, Burton dog walk, Ashby dog walk, Edale dog walk (elapsed time correct) <b>OR</b> Consistently combines time in locations and travel time <b>and</b> shows start and finish time (elapsed time correct) for at least <b>2</b> of these
	I6	Correct time in all locations	2	MN	Shows start and finish time for <b>all</b> of: Home, Burton coffee, Burton dog walk, Ashby dog walk, Edale dog walk (elapsed time correct) <b>and</b> starts no earlier than 8.30 am <b>and</b> at Burton coffee by 11.15 <b>OR</b> Consistently combines time in locations and travel time <b>and</b> shows start and finish time (elapsed time correct) for <b>all</b> of these <b>and</b> starts no earlier than 8.30 am <b>and</b> at Burton coffee by 11:15
	A4	Begins to process travelling time	1 or	P	Correct travel time allowed for at least <b>one</b> journey
	A5	Correct travelling time	2	PQ	Correct travel time allowed for <b>all</b> journeys
	I6	Clearly presented schedule	1	R	Sequentially ordered schedule showing at least start time in all locations for 5 activities, finished and home by 4:30 pm
<b>Total marks for question</b>			<b>5</b>		

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