

# Mark Scheme (Results)

January 2015

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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)	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. 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: Woodwork business

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R3	Starts the process to find number of plywood pieces fitting in the board (include area method)	1 or	A	$2440 \div 212 (=11.50..)$ <b>and</b> $1220 \div 202 (=6.03..)$ <b>OR</b> $2440 \div 202 (=12.07..)$ <b>and</b> $1220 \div 212 (=5.75..)$ <b>OR</b> $2440 \times 1220 (=2976800)$ <b>and</b> $202 \times 212 (=42824)$ Evidence of these could be shown in a diagram
	A4	Full process to find number of plywood pieces fitting in the board (include area method)	2	AB	$'11' \times '6' (=66)$ accept figures with decimals <b>OR</b> $'12' \times '5' (=60)$ accept figures with decimals <b>OR</b> $'2976800' \div 42824 (=69.51..)$ <b>OR</b> $'2976800' \div 66 (=45103.03..)$ <b>and</b> $202 \times 212 (=42824)$ <b>OR</b> $66 \times '42824' (=2826384)$ <b>and</b> $2440 \times 1220 (=2976800)$ Evidence of these could be shown in a diagram
	I6	Valid decision with correct figures	1	C	Yes <b>AND</b> 66 from $6 \times 11$ <b>OR</b> No <b>AND</b> 60 from $5 \times 12$ NB area method can only get 2 marks
Q1b	R2	Works with the £6	1	D	E.g. $59.8(0) - 6 (=53.8)$ <b>OR</b> $20 + 6 (=26)$ May be seen in subsequent calculation
	A4	Starts process to find the cost of one box or all boxes	1 or	E	$212.24 \div 120 (=1.76..)$ <b>OR</b> $120 \times 31.6(0) (=3792)$ <b>OR</b> $'53.8' \times 120 (=6456)$

	16	Full process to find the total cost of one box or all boxes	2	EF	'1.76..' + 31.60(=33.36..) <b>OR</b> ( '3792' + 212.24) ÷ 120(=33.36...) <b>OR</b> '3792'+212.24 (= 4004.24) <b>and</b> '53.8' × 120 (=6456) (costs for all boxes)
	R2	Full process to find figures to compare	1 or	G	'53.8' – '33.36..' (=20.43..) <b>OR</b> '26' + '33.36...' (=59.36) <b>OR</b> '53.8' – 20(=33.8) <b>OR</b> '33.36..' + 20(=53.36..) <b>OR</b> '6456' – '4004.24' (=2451.76) <b>and</b> 120 × 20(=2400) compares profit made with profit needed
	17	Valid decision with accurate figures	2	GH	Yes <b>AND</b> (£)[20.43, 20.44] <b>OR</b> Yes <b>AND</b> (£)[59.36, 59.37] <b>OR</b> Yes <b>AND</b> [33.36, 33.37] <b>and</b> 33.8(0) <b>OR</b> Yes <b>AND</b> (£)[53.36, 53.37] <b>and</b> (£) YES AND 2451.76 and 2400
<b>Q1c</b>	A4	Uses consistent units	1	J	× 1000 <b>OR</b> ÷ 1000 seen used appropriately eg 15000, 15.05, 0.35, 0.043..
	R2	Uses and evaluates formula	1 or	K	43 × 350 (=15050) oe <b>OR</b> '15000' ÷ 350 (=42.85..) <b>OR</b> '15000' ÷ 43 (=348.8..) <b>OR</b> 15 ÷ 350 (=0.04285..)
	16	Valid decision and accurate figures	2	KL	Yes <b>or</b> No <b>AND</b> 15.05 (litres) <b>OR</b> Yes <b>or</b> No <b>AND</b> 15000 and 15050 (cm <sup>3</sup> ) <b>OR</b> Yes <b>AND</b> [42.85, 42.9] (cm) <b>OR</b> Yes <b>AND</b> [348, 349] (cm <sup>2</sup> )
<b>Total marks for question</b>			<b>11</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2a	R1	Begins to process suitable graph or chart	1 or	M	<b>One</b> of: linear scale, plotting, labelling
	A4	Improves graph	2 or	MN	<b>Two</b> of: linear scale, plotting, labelling
	I6	Fully correct graph or chart	3	MNP	<b>All</b> of: linear scale, plotting, labelling (± 2 mm tolerance on plotting) Minimum acceptable labelling: (number of) orders, Oct, Nov, Dec, (puzzle) box, (flower) tub  Bar graph <b>OR</b> line graph
Q2b	A4	Full process to find mean	1 or	Q	$(11084 + 10654 + 12768 + 14784) \div 4 (=12322.5)$ <b>OR</b> $49290 \div 4 (=12322.5)$
	I6	Finds correct mean	2	QR	(£)12 322.5(0)
<b>Total marks for question</b>			<b>5</b>		



**Section B: Charity run**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R1	Begins to produce data collection sheet	1 or	A	Input opportunities <b>AND</b> headings for at least 2 of : male/female, under 30 and 30 – 50 and over 50 5km/10km
	R2	Improves data collection sheet	2 or	AB	Input opportunities <b>AND</b> headings for all features male/female, under 30 and 30 – 50 and over 50 5km/10km (may not be efficient- or could be suitable for individual lines of input or questionnaire).
	I6	Fully correct efficient data collection sheet.	3	ABC	Data collection sheet showing 12 categories with efficient input opportunities.
<b>Total marks for question</b>			<b>3</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4a	R2	Starts to find cost	1 or	D	$60 \times 0.69 (=41.4)$ <b>OR</b> $0.69 \times 2 \div 3(=0.46)$ allow use of 0. 666..or 0.667...oe <b>OR</b> $30 \div 60(=0.5)$
	A4	Full process to find total cost	2 or	DE	$'41.4' \times 2 \div 3(=27.6)$ allow use of 0. 666..or 0.667...oe <b>OR</b> $'0.46' \times 60(=27.6)$ <b>OR</b> $0.69 \times 2 \div 3(=0.46)$ allow use of 0. 666..or 0.667...oe <b>and</b> $30 \div 60(=0.5)$ <b>OR</b> $30 \div '0.46' (=65)$ medals can buy
	I6	Makes correct decision from correct figures	3	DEF	Yes <b>AND</b> (£)27.6(0) <b>OR</b> Yes <b>AND</b> (£)2.4(0) over <b>OR</b> Yes <b>AND</b> (£)0.46 and (£)0.5(0) <b>YES AND 65</b>
	A5	Valid check	1	G	Any valid check, e.g. reverse calculations from their working <b>OR</b> Approximation

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4b	R2	Uses consistent units	1	H	0.75 (l) <b>OR</b> 5000 (ml) (may be seen in subsequent calculations)
	R3	Process to find total amount of water needed or bottles that can be bought	1 or	J	55 × 0.75 (=41.25) <b>oe OR</b> 10 ÷ 1.06 (=9.43..) <b>OR</b> 5000 ÷ 750(= 6.6...) <b>OR</b> 5000 ÷ 55 (= 90.9)
	A4	Process to find number of 5l bottles needed or number of litres that can be bought	2 or	JK	'41.25' ÷ 5(=8.25) <b>OR</b> '9' × 5(=45) from rounding 9.43.. <b>OR</b> Or 55 ÷ '6.6..' (= 8.25) <b>OR</b> Or 750 ÷ '90.9' (= 8.25) <b>OR</b> Uses build-up method
	A4	Full process to find figures to compare	3	JKL	'9' × 1.06(=9.54) from rounding 8.25 <b>OR</b> '45' ÷ 0.75(=60) <b>OR</b> 45 ÷ 55 (=0.81..) <b>OR</b> '41.25' ÷ 5(=8.25) <b>and</b> 10 ÷ 1.06 (=9.43..) <b>OR</b> Or '6.6' × 9 ( from 9.43) (=60) <b>OR</b> 55 × 0.75 (=41.25) <b>and</b> '9' × 5(=45) <b>OR</b> Complete build-up method
	I7	Valid decision with correct figures	1	M	Yes <b>AND</b> (£)9.54 <b>OR</b> Yes <b>AND</b> 60 (people will get 750 ml of water) <b>OR</b> Yes <b>AND</b> 0.81..(litres per runner) <b>OR</b> Yes <b>AND</b> needs 8.25 or 9 bottles and can afford 9.43 or 9 bottles <b>OR</b> Yes <b>AND</b> needs 41.25 litres and can afford 45 litres NB If this mark is awarded, award mark H.

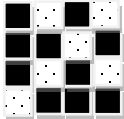
Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4c	A4	Works with percentage	1 or	N	0.34 × 55(=18.7) oe <b>OR</b> 24 ÷ 55 (=0.43...) <b>OR</b> 24 ÷ 55 × 100(=43. ...)
	I7	Correct answer	2	NP	No <b>and</b> 18.7 or 18 or 19 (new runners) <b>OR</b> No <b>and</b> [0.43, 0.44] <b>and</b> 0.34 <b>OR</b> No <b>and</b> [43, 44] (%)
<b>Total marks for question</b>			<b>11</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Works with probability	1 or	Q	15/585 =(1/39) <b>OR</b> 585 ÷ 40 (=14.625) <b>OR</b> 15 × 40(=600) <b>OR</b> 15 ÷ 585 (=0.0256..) <b>and</b> 1 ÷ 40(=0.025)
	I7	Valid decision based on correct figures	2	QR	No <b>AND</b> correct supporting figures  Accept 'Yes' with full explanation e.g. 0.0256.. nearly same as 0.025, or 1/39 nearly same as 1/40
<b>Total marks for question</b>			<b>2</b>		

Section C: Home improvements

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R1	Starts to substitute	1 or	A	$0.0956 \times 7600 (=726.56)$ <b>OR</b> $0.0956 \div 3 (=0.0318\dots)$ <b>OR</b> '297' $\times 3 (=891)$ (297 is awarded in mark D)
	A4	Completes substitution	2 or	AB	$0.0956 \times 7600 \div 3 (=242.18\dots)$ <b>OR</b> '891' $\div 0.0956 (=9320)$
	I6	Correct answer	3	ABC	(£)[242, 243] <b>OR</b> (£)9320
	R3	Checks affordability	1 or	D	$1850 + '242.18\dots' (=2092.18\dots)$ <b>OR</b> $2147 - '242.18\dots' (=1904.81\dots)$ $2147 - 1850 (=297\text{pm})$
	I7	Valid decision based on correct calculations	2	DE	Yes <b>AND</b> (£)[242, 243] <b>and</b> (£) 297 <b>OR</b> Yes <b>AND</b> (£) [2092, 2093] <b>OR</b> Yes <b>AND</b> (£) [1904, 1905] <b>OR</b> Yes <b>AND</b> (£) [54, 55] YES <b>AND</b> (up to) (£) 9320
<b>Total marks for question</b>			<b>5</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7a	R1	Begins to consider scale	1 or	F	Rectangle with one dimension 6.5 squares or 3 squares <b>OR</b> Rectangle 13 by 6 <b>or</b> 3.25 by 1.5
	I6	Scale used correctly	2 or	FG	Rectangle 6.5 squares by 3 squares <b>OR</b> Rectangle with one dimension 6.5 squares or 3 squares correctly positioned: At least 2 squares from the sink At least 4 squares from the door Over the water pipes (at least one square)
	A5	Fully correct solution	3	FGH	All of: Rectangle 6.5 squares by 3 squares At least 2 squares from the sink At least 4 squares from the door Over the water pipes (at least one square)

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
<b>Q7b</b>	R2	Begins to work with criteria	1 or	J	Makes a symmetrical pattern with at least 5 more tiles
	A5	Finds complete solution	2	JK	Uses 13 tiles correctly in a symmetrical pattern (correct number of each type of tiles) (Line symmetry horizontally, vertically or diagonally, or rotational symmetry)  Example answer 
<b>Q7c</b>	I6	Select correct fan	1	L	C indicated <b>OR</b> (£)79.98 May be marked on table
	R2	Works with discount	1 or	M	Eg $0.9 \times '79.98'$ (=71.982) <b>or</b> $0.1 \times '79.98'$ (=7.998) Allow use of any price from the table
	A4	Correct answer in correct money notation	2	MN	(£) 71.98 or (£) 71.99 <b>OR</b>  Allow (£)130.49 or (£)188.99 or (£)67.03or (£)130.50 or (£)189(.00) or (£)67.04  Correct money notation required
<b>Total marks for question</b>			<b>8</b>		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8	R2	Converts time	1 or	P	E.g. 0.75(h), $\frac{3}{4}$ (h), 30 (mins), 2.5 (h), 150 (mins), 16:00
	A4	Works with all features	2 or	PQ	$2 \times (0.75 + 2.5)$ (= 6.5 hrs) <b>OR</b> $'16' - 9$ (=7 hrs) <b>OR</b> $2 \times (45 + 150)$ (=390min) <b>OR</b> 420 (min) <b>OR</b> 3.30 pm <b>OR</b> 15.30 and 16.00 <b>OR</b> Subtracts 3 times from 4 pm <b>or</b> Adds at least 3 times to 9 am.  Times could be shown on a time plan or schedule throughout
	I7	States decision with correct figures	3	PQR	Yes <b>AND</b> she will finish at 3.30pm or 30 min early <b>OR</b> Yes <b>AND</b> she needs to start by 9:30 <b>OR</b> Yes <b>AND</b> 7 and 6.5(hours) oe
<b>Total marks for question</b>			<b>3</b>		



