

Mark Scheme (Results)

March 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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,)	1 or	1 of linear scale(s), labels, plotting (2mm tolerance)
	2 or	2 of linear scale(s), labels, plotting (2mm tolerance)
	3	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: Making chocolates

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	A4	Works with consistent units	1	A	Uses 1000 g OR 0.05 kg E.g. In $1000 \div 50 (=20)$ oe
	R2	Process to work out proportion	1 or	B	'1000' \div 50 (=20) OR $10 \times 5 \times 100 (=5000)$ (g) OR $280 \div 50 (=5.6)$
	R3	Process to work out amount of chocolate	2 or	BC	$280 \times '20'$ (=5600) (g) OR '5000' \div 280 (=17.85..) or 17 from a build-up method OR $10 \times 5 \times 100 (=5000)$ (g) and '1000' \div 50 =20 OR '1000' \times '5.6' (=5600) (g)
	A4	Complete process to find figures to compare	3 or	BCD	$10 \times 5 \times 100 (=5000)$ (g) and $280 \times '20'$ (=5600) (g) OR '5000' \div '20' (=250) g per batch OR '5000' \div 280 (=17.85.. or 17) and '1000' \div 50 =20 OR '5000' \div '5600' (=0.89..) OR '17.85' \times 50 (=892.8..) OR '5600' \div 500 (=11.2)
	I7	Correct decision and accurate figures	4	BCDE	No and 5600 (g) and 5000 (g) oe OR No and 250 (g of chocolate) OR No and [17, 17.9].. and 20 (batches) OR No and 0.89..(kg of butter) OR No and 11.2 (packs needed) NB Also award Mark A if Mark E is awarded.

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(b)	R2	Process to work with proportion	1 or	F	$9 \times 2 (=18)$ OR $10000 \div 10 (=1000)$ and $(£)153.14 \div 10 (= (£)15.314)$ OR $(£)153.14 \div 10\ 000 (=1.5314(p))$ OR $(£)9 \div 500 (=1.8(p))$ OR $10\ 000 \div 500 (=20)$ OR $500 \div (£)9 (=55.5... g)$ OR $10000 \div (£)153.14 (=65.2.... g)$ OR allow build up method for price – at least 3 steps
	A4	Complete process to find figures to compare	2 or	FG	$'20' \times 9 (= (£)180)$ (for 10 000 g) OR $'1.5314' \times 500 (= [7.65, 7.7(0)])$ (for 500g) OR $9 \times 2 (=18)$ and $(£)153.14 \div 10 (= (£)15.314)$ (for 1 kg) OR $1.53....(p)$ and $1.8(p)$ (for 1 g) OR $500 \div 9 (= [55, 56](g))$ and $10\ 000 \div 153.14 (= [65, 66](g))$ (for £1)
	I7	Correct decision and correct figures	3	FGH	Online AND accurate figures
Total marks for question			8		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R2	Process to compare dimensions of box with dimensions of truffles	1 or	J	13.6 ÷ 3 (=4.53) OR 13.6 ÷ 2 (=6.8) OR 7.8 ÷ 3 (=2.6) OR 7.8 ÷ 2 (3.9) OR 6.4 ÷ 2 (=3.2) OR 6.4 ÷ 3 (=2.133..) build up method along one side e.g. 3 + 3 + 3 + 3(= 12) OR considers dimensions e.g. 6.4 cm means 3 truffles high May be seen in diagram Condone volume or area processes 3×3×2(=18) or 6.4×7.8×13.6(=678.912) or 3×3(=9) or 13.6×7.8 (=106.08)
	A4	Complete process for 3 dimensions	2	JK	e.g. 13.6 ÷ 3 (=4.53) AND 7.8 ÷ 3 (=2.6) AND 6.4 ÷ 2 (=3.2) OR complete build up method on all 3 sides using 3 cm and 2 cm May be seen in diagram Condone complete volume or area process '678.912' ÷ '18'(=37.7..) or ('106.08' ÷ '9') × 3 (=35.36)
	I6	Interprets calculations correctly to work with whole numbers	1or	L	'4' × '2' × '3' (=24) OR '6' × '2' × '2' (=24)
	I7	Accurate figures	2	LM	24 (truffles)
Total marks for question			4		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3a	I7	Interprets table to make a valid statement	1	N	Valid statements include number of boxes sold increases up to £5.50 or week 4 number of boxes sold starts to decrease after £5.50 or week 4 £5.50 or week 4 sells most
Q3b	R2	Begins to calculate amount of money made in week 1 and week 6	1 or	P	$60 \times 4 (=240)$ OR $71 \times 6.5 (=461.5)$
	A4	Complete process to find figures to compare	2 or	PQ	'(£)240' \times 2(=(£)480) and '(£)461.5(0)' OR '(£)461.5(0)' \div 2(=(£)230.75) and '(£)240' OR '(£)461.5(0)' $-$ '(£)240'(=(£)221.5(0)) and '(£)240' OR '(£)461.5(0)' \div '(£)240'(=1.9)
	I6	Makes decision from accurate figures	3	PQR	eg No and (£)480 and (£)461.5(0) OR No and (£)230.75 and (£)240 OR No and (£)221.5(0) and (£)240 OR No and (£)18.5(0) OR Yes and 1.9 rounds to 2 OR he's wrong, (£)240 is more than half of (£)461.5(0)
Total marks for question			4		

Section B: Cycling holiday

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4a	R1	Complete process for percentage	1 or	A	$0.18 \times 529.99 (= (£)95.3982)$ OR $529.99 \times 0.82 (= (£)434.5918)$ OR $99 \div 529.99 \times 100 (=18.67959.. (%))$ OR $430.99 \div 529.99 (=0.813..)$ and $100 - 81.3 (=18.7(%))$ OR $430.99 \div 0.82 (=525.59..)$ OR Complete build-up method
	A4	Finds accurate figures to compare	2	AB	$(£)[95.39, 95.4]$ OR $(£)[434.59, 434.6]$ OR $[18.6, 18.7](%)$ OR $(£)[525.59, 525.6]$
	I6	Correct ft decision	1	C	Correct ft decision provided mark A is awarded e.g. Nick is correct or the advert has a mistake
Q4b	A4	Correct process for cost of Brian's Bikes or eliminates Brian's Bikes from being cheapest	1	D	$395 + 40.46 (= (£)435.46)$ OR $430.99 - 395 (= (£)35.99)$
	R2	Correct process for cost of Cutprice Bikes	1 or	E	$475 \div 10 (= (£)47.5)$ OR $475 \times 0.9 (= (£)427.5)$
	A4	Complete process to find figures to compare	2 or	EF	$395 + 40.46 (= (£)435.46)$ or $430.99 - 395 = (£)35.99$ AND $475 - 47.5 (= (£)427.5)$ or $475 \times 0.9 (= (£)427.5)$
	I6	Correct decision from accurate figures	3	EFG	Cutprice Bikes and $(£)427.5(0)$ and $(£)435.46$ or $(£)35.99 < (£)40.46$
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5a	R1	Works with time	1	H	Finds 6 days to cycle
	R2	Correct process to work with distance cycled per day or number of hours to cycle total distance	1 or	J	18×6 (=108 miles can be cycled per day) OR $645 \div '6'$ (=107.5... miles to be cycled each day) OR $645 \div 18$ (=35.8333....) hours OR $'6' \times 6$ (=36 hours available to cycle)
	A4	Complete correct process	2 or	JK	$'108' \times '6'$ (=648 miles can be cycled in 6 days) OR $645 \div '108'$ (=5.9... days to travel 645 miles) OR $'107.5 \div 6$ (=17.9... mph) OR $'35.8333'$ and $('7' - 1) \times 6$ (= 36) hours OR $'36' \times 18$ (=648 miles can be cycled in 6 days) OR counting up from 0 or down from 645 in 108s
	I6	Calculates correct figures for comparison	3	JKL	648 (miles) OR 6 days to cycle AND 5.9.... days needed OR 17.9(mph) OR 108 (miles) AND 107.5 (miles) OR 36 hours AND [35.8, 35.9]
	I7	Correct decision from their figures provided mark K awarded	1	M	E.g. Yes and can cycle 648 miles in 6 days OR Yes and only needs to cycle at 17.9(mph) OR Yes and can cycle 108 miles per day, only needs to travel 107.5 miles per day OR Yes and have 36 hours of cycling available and will take [35.8, 35.9] hours

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5b	I6	Process to interpret graph	1	N	e.g. £10 = €12 OR £50 = €60 OR £100 = €120 could be seen on graph
	R3	Uses correct method with their conversion rate to work out number of euros	1 or	P	e.g. $4 \times '120' + 30 (=510)$ OR $'120' + '120' + '120' + '120' + ('120' \div 4) (=510)$
	A4	Correct number of euros calculated for £425	2	PQ	510 (€) ft their figures, each must be read to within €1
	A5	Valid check	1	R	E.g. reverse calculation, estimation, different method
Total marks for question			9		

Section C: Summer party

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(a)	R1	Process to substitute into formula	1 or	A	Multiplies two of $785 \times 4.2^2 \times 0.8$ OR $4.2 \times 4.2(=17.64)$
	A4	Full process for substitution	2 or	AB	Multiplies all of $785 \times 4.2^2 \times 0.8(=11077.92)$
	I6	Accurate figures	3	ABC	[11077, 11078] (litres)

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6(b)	A4	Works consistently with time	1	D	E.g. 6.5 hrs o.e. or 390 mins or adds time on to 8.45 or subtracts from 3.15 May be seen or implied by subsequent working
	R2	Process to work with rate of flow or time available	1 or	E	11100 ÷ 30 (=370) OR '390' × 30 (=11700) (litres in 390 minutes) OR 11100 ÷ 6.5(=1707.6..) OR 60 × 30(=1800) (litres per hour) and '6.5' OR Works forward from 8:45 am or backwards from 3:15 pm (at least 1 hour)
	A5	Full process to find figures to compare	2 or	EF	11700 (litres) '370' ÷ 60(=6.16..) (hours) (or 6 hours 10 minutes) OR '1800' × '6.5'(=11700) (litres in 6.5 hours) OR 11100 ÷ '390'(=28.4..) (litres per minute) OR Full process to work forward from 8:45 am or backwards from 3:15 pm
	I7	Valid decision and accurate figures	3	EFG	E.g. No and 370 (mins) and 390 (mins) OR Yes and has 6.5 hours and needs 6.16.. hours OR No and in 6.5 hours can fill 11700 litres OR Yes and only need the hose to fill at 28.4 (litres per minute) OR Yes and filled by 2:55pm OR No and only needs to turn tap on at 9:05am OR No and 20 minutes too long
Total marks for question			7		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R2	Uses correct process to convert between units	1 or	H	$15 \times 0.3 (=4.5)$ (metres) OR $4.4 \div 0.3 (= [14.6, 14.7]..)$ (feet)
	I7	accurate figures	2	HJ	4.5(m) OR [14.6, 14.7] (feet)
	I6	Suitable sketch showing measurements to support conclusion	1	K	Sketch of circle within square (may be touching) with measurements marked provided mark H is awarded
Total marks for question			3		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(a)	R1	Process to work with length or width of garden	1 or	L	E.g. $1 + 5 + 2 + 6.5 + 1$ OR $1 + 7 + 1$ OR $9 - 2 = 7$ OR $1 + 6.5 + 1$ OR $1 + 5 + 2 + 7 + 1$ Can be shown on diagram
	A4	Complete correct process	2 or	LM	E.g. $1 + 5 + 2 + 6.5 + 1$ and $1 + 7 + 1$ OR $1 + 6.5 + 1$ and $1 + 5 + 2 + 7 + 1$ Can be shown on diagram
	I7	Correct decision from valid figures	3	LMN	Yes and E.g. bouncy castle needs 15.5 (m) length or 8.5 (m) width

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8(b)	R1	Process to work with scale	1 or	P	E.g. 10 squares is 5 m may be marked on diagram OR 10 cm: 5 m OR $500 \div 10 (=50 \text{ (cm)})$ OR 1:500 = 1cm: 500cm OR 10:5000 = 10cm: 5000 cm
	A4	Correct process to convert between units to find valid figures to compare	2 or	PQ	10: 500 OR 1: 50 OR 1cm: 5m accept equivalences OR 5000 cm = 50 m
	I7	Correct decision from valid working	3	PQR	No AND 1:50 or 10:500 OR No and diameter of diagram should be 1cm OR No and diameter of pool is 50 m
Total marks for question			6		

