

Mark Scheme (Results)

January 2018

Functional Skills Mathematics Level 2

FSM02

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FUNCTIONAL SKILLS (MATHEMATICS) MARK SCHEME – LEVEL 2 – JANUARY 2018

Guidance for Marking Functional Skills Maths 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 his or her answer.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the functional demand of the 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 in a written paper); mark the better answer.
- **Incorrect method** if it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.
- **Follow through marks (ft)** 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.

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

- 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 ÷ 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 **oe** 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
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in other parts of a question, even if not explicit in the expected part. E.g. checks in on earlier answer box.
- **Graphs**
 The mark schemes for most graph questions have this structure:

Process	Mark	Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph)	1 or	1 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	2 or	2 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	3	all of: linear scale(s), labels, accurate 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**, and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. Thus a graph that is 'fit for purpose' is one where 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, even if the scale is not linear.

The mark schemes for **Data Collection and/ or summary Sheets** refer to **input opportunities** and to **efficient input opportunities**.

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

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.

Discuss any queries with your Team Leader.

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Section A: Entertainment park

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R3	Begins to solve the problem	1 or	A	(6pm – 10am) – 1(=7) oe OR (6pm – 10am) × 5 (=40) oe OR (6pm – 10am) × 8.75 (=70) oe OR 5 × 8.75 (=43.75) oe
	A4	Full process to find total earnings	2 or	AB	(‘40’ – 5) × 8.75 (=306.25) OR ‘7’ × 5 × 8.75 (=306.25) OR (‘70’ – 8.75) × 5 (=306.25) oe
	I6	Correct answer	3	ABC	(£)306.25

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence																																		
Q1(b)	R1	Starts creating a data collection sheet	1 or	D	Input opportunities AND at least 2 of: Heading for gender (male, female) Heading for age (<18, 18-30, >30) Heading for time spent (<2 hours, 2-4 hours, >4 hours)																																		
	I6	Improves solution	2 or	DE	Input opportunities AND all of: Heading for male, female Heading for <18, 18-30, >30 Heading for <2 hours, 2-4 hours, >4 hours May be inefficient or questionnaire																																		
	I6	Efficient data collection sheet	3	DEF	Efficient input opportunities AND all of: Heading for male, female Heading for <18, 18-30, >30 Heading for <2 hours, 2-4 hours, >4 hours Allow 2 tables with efficient input opportunities e.g. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th colspan="3">M(ale)</th> <th colspan="3">F(emale)</th> </tr> <tr> <th></th> <th>< 18</th> <th>18-30</th> <th>>30</th> <th>< 18</th> <th>18-30</th> <th>>30</th> </tr> </thead> <tbody> <tr> <td>< 2 hours</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 – 4 hours</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>> 4 hours</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		M(ale)			F(emale)				< 18	18-30	>30	< 18	18-30	>30	< 2 hours							2 – 4 hours							> 4 hours					
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< 2 hours																																							
2 – 4 hours																																							
> 4 hours																																							
Q1(c)	A4	Full process to find the mean	1 or	G	$(4215 + 4726 + 4321 + 4952 + 5021 + 5158 + 4924) \div 7$ (=4759.571..)																																		
	I7	Accurate rounded answer	2	GH	4760																																		
Total marks for question			8																																				

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2(a)	R3	Full process to work out an area	1 or	J	e.g. $27 \times 66 (=1782)$ OR $30 \times 70 (=2100)$ OR $27.1 \times 65.9 (= 1785.89)$
	I6	Correct estimated answer and correct units	2	JK	e.g. 1782 m^2 OR 2100 m^2 OR 1786 m^2 (correct units required)
Q2(b)	A5	Valid statement	1	L	Ft part (a) e.g. overestimation as I rounded up my final figure OR Could be either I rounded 1 figure up and 1 figure down
Total marks for question			3		

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R2	Begins to work with cost or percentage	1 or	M	$62 + 95 + 95 + 130 + 130 (=512)$ oe OR $2 \times 143.97 (=287.94)$ OR $62 \times 0.37 (=22.94)$ oe or $95 \times 0.37(=35.15)$ oe or $130 \times 0.37(=48.1)$ oe OR $(100 - 37) \div 100 (=0.63)$ oe Allow process to find 37% of any ticket price
	R3	Works with percentages	2 or	MN	$'512' \times 0.37 (=189.44)$ oe OR $'22.94' + 2 \times '35.15' + 2 \times '48.1' (=189.44)$ OR $62 \times '0.63' (=39.06)$ oe or $95 \times '0.63'(=59.85)$ oe or $130 \times '0.63'(=81.9)$ oe OR $2 \times 143.97 (=287.94)$ and process to find 37% of any ticket price Allow process to find 63% of any ticket price
	A4	Full process to find the discounted price of the correct 5 tickets	3 or	MNP	$'512' \times 0.63 (=322.56)$ oe OR $'512' - '189.44' (=322.56)$ OR $'39.06' + 2 \times '59.85' + 2 \times '81.9' (=322.56)$ oe
	A4	Process to add all the costs for the family	1 or	Q	$'322.56' + 2 \times 143.97 (=610.5)$ Allow $'512' + 2 \times 143.97(=799.94)$ Allow $'189.44' + 2 \times 143.97(=477.38)$
	I6	Accurate figure in correct money notation	2	QR	£610.50 in correct money notation
Total marks for question			5		

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Section B: Collecting coins

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	R1	Identifies original and most recent value for coin A	1	A	200 and 380 May be implied in subsequent working
	A4	Begins to substitute in the formula	1 or	B	(‘380’ – ‘200’) ÷ ‘200’ (=0.9) OR (‘380’ – ‘200’) × 100 (=18000) Allow (700 – 450) ÷ 450 (=0.55)
	A4	Full process to find figures to compare	2 or	BC	(‘380’ – ‘200’) ÷ ‘200’ × 100(=90) oe Allow (700 – 450) ÷ 450 × 100 (=55.5)
	I7	Correct decision with accurate figures	3	BCD	(Coin) A AND ‘90’ (%)
Q4(b)	R3	Begins to work with option A	1 or	E	850 ÷ 5 (=170) OR 65.49 × 12 (=785.88)
	A4	Full process to find total with option A	2	EF	‘170’ + ‘785.88’ (=955.88)
	R2	Begins to work with option B	1 or	G	850 × 0.13 (=110.5) oe OR (100 + 13) ÷ 100 (=1.13) oe
	A4	Full process to find total with offer B	2	GH	850 × 1.13 (=960.5) oe
	I7	Valid decision with accurate figures	1	J	(option) A AND (£)955(.88) and (£) 960(.5)
Total marks for question			9		

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Begins to work with scale	1 or	K	Draws at least 1 square with side length of 5 cm (10 sqs) OR 1 rectangle 5 cm (10 sqs) by 1.5 cm (3 sqs) OR Draws a net of a cuboid (of any size)
	I6	Develops solution	2 or	KL	Draws a net of a cuboid 5 cm by 5 cm by 1.5 cm with one square or rectangle missing or incorrect
	I6	Correct drawing of the net	3	KLM	Correct and accurate net of the cuboid L: 5 cm, W: 5 cm, H: 1.5 cm
Total marks for question			3		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R1	Selects correct membership price	1	N	(\$) 199 indicated or used in subsequent calculations
	A4	Full process to find figures to compare	1 or	P	'199' \div 1.286 (=154.74..) OR 150×1.286 (=192.9)
	I7	Valid decision with accurate figures	2	PQ	No AND (£)154(.74..) OR No AND (\$)192(.9)
	A5	Valid check	1	R	Valid check, e.g. reverse calculation or alternative method
Total marks for question			4		

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Section C: Meeting venue

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(a)	R2	Begins to work with days or people	1 or	A	e.g. $459 \times 2 (=918)$ OR $459 \times 3 (=1377)$ OR $87 \times 35(=3045)$ OR $87 \times 2(=174)$ OR Subtracts one relevant cost from 9000 e.g. $9000 - 459(=8541)$ OR $94.99 \div 2 (=47.495)$ OR $9000 \div 2 (=4500)$
	R3	Develops solution	2 or	AB	e.g. $459 \times 3 \times 2 (=2754)$ and $87 \times 35 \times 2 (=6090)$ OR Subtracts one relevant cost for 2 days from 9000 e.g. $9000 - '2754' (=6246)$ OR $459 \times 3 + 87 \times 35 + '47.495' (=4469.495)$
	A4	Process to find figures to compare	3 or	ABC	e.g. $'2754' + 94.99 + '6090' (=8938.99)$ oe OR $9000 - '2754' - 94.99 - '6090' (= 61.01)$ oe OR $'4469.495' \times 2 (=8938.99)$ OR $459 \times 3 + 87 \times 35 + '47.495' (=4469.495)$ and $9000 \div 2 (=4500)$
	I7	Valid decision with accurate figures	4	ABCD	e.g. Yes AND (£) 8938(.99) OR Yes AND (£) 61(.01)(less) OR Yes AND (£) 4469 (.495) and (£) 4500

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(b)	R1	Finds a missing length	1	E	e.g. $6.7 - 2.2 (=4.5)$ OR $5.8 - 3.1 (=2.7)$ Condone $(5.8 - 3.1) \div 2 (=1.35)$
	R2	Process to find one relevant area	1 or	F	e.g. $'4.5' \times 5.8 (=26.1)$ OR $3.1 \times 2.2 (=6.82)$ OR $6.7 \times 5.8 (=38.86)$ OR $'2.7' \times 2.2 (=5.94)$ OR $6.7 \times 3.1 (=20.77)$ OR $'4.5' \times '2.7' (=12.15)$ Condone $'1.35' \times '4.5' (=6.075)$ or $'1.35' \times 2.2 (=2.97)$
	A4	Full process to find total area or process to find number of people that can fit in one relevant area	2	FG	e.g. $'26.1' + '6.82' (=32.92)$ OR $'38.86' - '5.94' (=32.92)$ OR $'20.77' + '12.15' (=32.92)$ OR $'26.1' \times 2 (=52.2)$ OR $6.82 \times 2 (=13.64)$
	A4	Full process to find the figures to compare	1 or	H	e.g. $'32.92' \times 2 (=65.84)$ OR $'52.2' + '13.64' (=65.84)$ OR $60 \div '32.92' (=1.82..)$ OR $60 \div 2 (=30)$ Allow working with perimeter for this mark only
	I7	Valid conclusion with accurate figures	2	HJ	e.g. Yes AND 65(.84 people) OR Yes AND 1.8(2.. people per m ²) OR Yes AND 32(.92 m ²) and 30 (m ²)
Total marks for question			9		

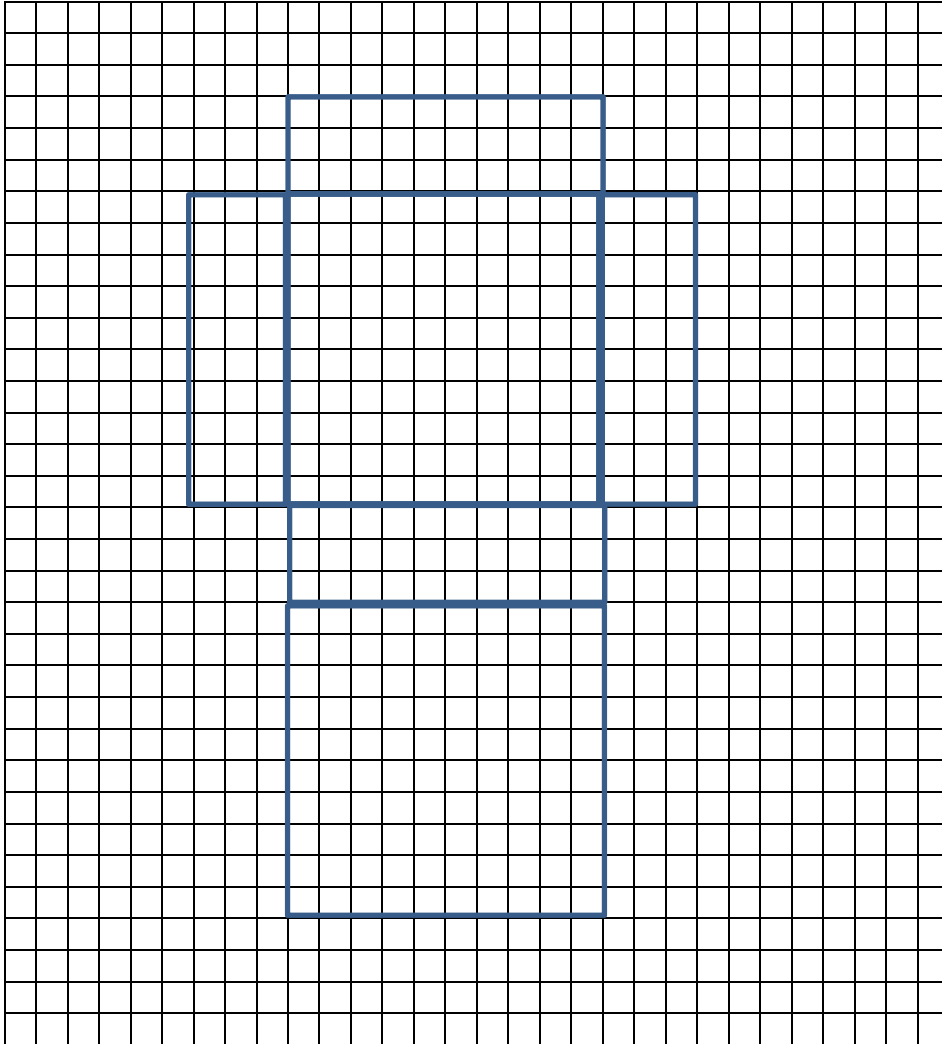
FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8	R3	Begins to work with proportion in the pie chart	1 or	K	e.g. $720 \div 360 (=2)$ or $380 \div 190 (=2)$ OR $360 \div 720 (=0.5)$ or $190 \div 380 (=0.5)$
	A4	Complete method to find an angle	2 or	KL	$300 \div '2'$ (=150) or $40 \div '2'$ (=20) oe OR $300 \times 0.5 (= 150)$ or $40 \times 0.5 (=20)$ oe NB angles can be implied by an accurate drawing ($\pm 2^\circ$) NB labels not required
	I6	Fully correct chart	3	KLM	Draws a pie chart with angles at the centre of the sectors (190°), 150° and 20° ($\pm 2^\circ$) Minimum labels g(ood), p(oor),
Total marks for question			3		

**FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018**

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R2	Begins to work with ratio	1 or	N	178 ÷ 45 (=3.95..) OR 8 ÷ 2 (=4) OR 4:90 seen or implied OR 45 ÷ 2 (=22.5) OR 178 ÷ 8 (=22.25)
	A4	Full process to find figures to compare	2 or	NP	'3.95..' × 2 (=7.91..) OR 178 ÷ 45 (=3.95..) and 8 ÷ 2 (=4) OR 8:180 seen or implied OR '4' × 45 (=180) OR 45 ÷ 2 (=22.5) and 178 ÷ 8 (=22.25)
	I7	Valid decision with accurate figures	3	NPQ	Yes AND 7.9(1..) OR Yes AND 3.95 and 4 OR Yes AND 180 OR Yes AND 22.5 and 22.25
	A5	Valid check	1	R	Valid check, e.g. reverse calculation or alternative method
Total marks for question			4		

**FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – JANUARY 2018**



Example of correct answer to question Q5

Ofqual



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



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