

Mark Scheme (Results)

July 2016

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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 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 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 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 $£12 \div 5$,
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
 - (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: Clothes shops

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	A4	Full process to find the mean	1 or	A	$(87 + 73.5 + 91.8 + 94 + 92.4 + 100.9) \div 6 (=89.93333..)$
	I6	Correct answer	2	AB	(£) 89933.33.. accept rounded or truncated figure to three or more significant figures NB accept 89.9(3..)
	A5	Check	1	C	Valid check, e.g. reverse calculation or alternative method
Q1(b)	R3	Begins the process to find probability	1 or	D	$5800 + 2300 + 1700 + 3900 (=13700)$
	I6	Correct answer	2	DE	$\frac{3900}{13700}$ oe or 0.28(46..) or 28(.46..) % NB Do not accept ratio
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R1	Begins working with percentage or the number of days or employees	1	F	$139000 \times 0.85 (=118150)$ OR $2500 \times 3 (=7500)$ OR $2500 \times 4 (=10000)$
	R3	Works with the total for 4 days and 3 employees	1 or	G	$'118150' - 89850 (=28300)$ OR $'7500' \times 4 (=30000)$ OR $'10000' \times 3 (=30000)$
	A4	Develops solution	2 or	GH	$'28300' \div 4 (=7075)$ OR $'28300' \div 3 (=9433.33..)$ OR $'30000' + 89850 (=119850)$
	A4	Full process to find figures to compare	3 or	GHJ	$'7075' \div 3 (=2358.33..) \text{ oe}$ OR $'9433.33..' \div 4 (=2358.33..) \text{ oe}$ OR $139000 \times 0.85 (=118150)$ and $'30000' + 89850 (=119850)$ OR $'119850' \div 139000 \times 100 (=86.223..) \text{ oe}$ OR $'119850' \times 100 \div 85 (=141000)$ OR $'28300' \div 4 (=7075)$ and $2500 \times 3 (=7500)$ OR $'28300' \div 3 (=9433.33..) \text{ and}$ $2500 \times 4 (=10000)$
I7	Correct conclusion with accurate figures	4	GHJK	Yes/No AND (£) 2358(.33..) OR Yes/No AND (£) 118150 and (£) 119850 (85% of the target) OR Yes/No AND 86(.22.. %) OR Yes/No AND (£) 141000 (July's target) OR Yes/No AND (£) 7075 and (£) 7500 (per person) OR Yes/No AND (£) 9433(.33..) and (£) 10000 (per day)	
Total marks for question			5		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R3	Process to find a missing dimension or the process to find an area	1 or	L	21.4 – 16.5 (=4.9) OR 18.1 – 8.4(=9.7) OR 21.4 × 8.4 (=179.76) OR 18.1 × 16.5(=298.65) OR 21.4 × 18.1 (=387.34) OR
	A4	Process to find a missing dimension and the process to find an area	2 or	LM	21.4 × 8.4 (=179.76) and 18.1 – 8.4(=9.7) OR 18.1 × 16.5(=298.65) and 21.4 – 16.5 (=4.9) OR '4.9' × 8.4 (=41.16) OR '9.7' × 16.5 (=160.05) OR 21.4 × 18.1 (=387.34) and 18.1 – 8.4(=9.7) or 21.4 – 16.5 (=4.9) OR '4.9' × '9.7' (=47.53)
	A4	Full process to find the total area	3	LMN	'179.76' + '160.05' (=339.81 m ²) OR '298.65' + '41.16' (=339.81 m ²) OR '387.34' – '47.53' (=339.81 m ²)
	R1	Begins to work with the rule	1 or	P	'339.81' × 131.35(=44634.043) OR '339.81' × 0.484(=164.46..) OR NB area figure may be rounded
	I6	Full process to find the business rate	2 or	PQ	'44634.043' × 0.484(=21602.87..) OR '164.46..' × 131.35(=21602.87..)
	I6	Correct answer	3	PQR	(£)[21602, 21603] OR (£)21614(.956)
Total marks for question			6		

Section B: Birthday party

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R2	Begins the process to find total cost or cost per child	1 or	A	$3 \times 30(=90)$ OR $6.80 \times 12(=81.6)$ OR $2.29 \div 6 (=0.381..)$ OR $400 \div 12(=33.33..)$ OR $150 \div 12 (=12.5)$ Allow $2.29 \times 12 (=27.48)$
	A4	Develops solution	2 or	AB	$2.29 \times 12 \div 6 (=4.58)$ OR $(3 \times 30) \div 12 (=7.5)$ OR Adds at least 3 costs together OR Subtracts at least 3 costs from (£)400 or from (£)33.33.. Allow use of '27.48'
	I6	Full process to find the total cost at village hall or cost per child	3	ABC	$'90' + 150 + '81.6' + '4.58' (=326.18)$ OR $'7.5' + '12.5' + 6.8 + '0.381..' (=27.181..)$ OR $400 - '90' - 150 - '81.6' - '4.58'(=73.82)$ OR $'33.33..' - '7.5' - '12.5' - 6.8 - '0.381..' (=6.15..)$ Allow use of '27.48' (leads to (£)349.08)
	R3	Process to find total of lunch at princess party or cost per child	1 or	D	$4.49 \times 12 (=53.88)$ OR $299 \div 12 (=24.91..)$ Allow $299 \div 15 (=9.93) \times 12(=239.04)$
	I6	Full process to find total cost or cost per child at princess party	2	DE	$'53.88' + 299 (=352.88)$ OR $'24.91' + 4.49 (=29.4066..)$ OR $400 - '53.88' - 299(=47.12)$ OR $'33.33..' - 4.49 - '24.91..' (=3.92..)$ Allow $'53.88' + '239.04' (=292.92)$
	A5	Decision with accurate figures and valid reason	1	F	e.g. Village hall is cheapest AND (£)326(.18) and (£)352(.88) OR Princess party is less work and within budget (£) 27(.181..) and (£) 29(.40..) and (£)33.33(..)
Total marks for question			6		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R3	Process to find a 1/3 of the total price	1 or	G	$(19.99 + 8.99 + 6.99 + 4.99) \div 3 (=13.653..)$ oe Allow $46.46 \div 3 (=15.48..)$ Allow use of 0.33... or 0.66.. or better
	A4	Full process to find cost of outfit	2 or	GH	'13.653..' $\times 2(=27.306..)$ oe Allow $46.46 \times 2 \div 3 (=30.97..)$
	I6	Correct answer in correct money notation	3	GHJ	£27.30 or £27.31 in correct money notation
	A5	Valid check	1	K	Valid check, e.g. reverse calculation or estimation
Total marks for question			4		
Q6(a)	R2	Converts units or begins working with time	1 or	L	Adds or subtracts three correct times (may be seen in build-up) OR 3 hours 50 minutes oe
	A4	Full process to find start time	2 or	LM	$2.30 - 25 - 70 - '90' - '45' - '120'(=08.40)$ oe Allow appropriate use of mixed time formats OR 5 hours 50 minutes oe
	I6	Correct answer	3	LMN	8.40 (am) OR 0840 Allow any time before 8.40 am only if LM awarded
Q6(b)	R1	Begins to work with ratio	1 or	P	e.g. $140 \div 12 (=11.66..)$ OR $40 \div 12 (=3.33..)$ OR $500 \div 140 (=3.57..)$ OR $500 \div 40 (=12.5)$
	A4	Full process to find figures to compare	2 or	PQ	e.g. '11.66..' $\times 40 (=466.66..)$ OR '3.33..' $\times 140 (=466.66..)$ OR '3.57..' $\times 12 (=42.85..)$ OR $140 \div 12 (=11.66..)$ and $500 \div 40 (=12.5)$
	I7	Correct conclusion with accurate figures	3	PQR	Yes AND [466, 467](g) OR Yes AND 42(.85) (cakes can be made) OR Yes AND 11(.66..) and 12(.5 g of sugar per cake)
Total marks for question			6		

Section C: Home improvements

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R2	Begins engaging with scale	1 or	A	E.g. $3000 \div 50 (=60)$ oe or 4 squares = 1 metre oe OR Draws 1 of: base 10 sq lengths, side 12 sq lengths, side 15 sq lengths OR Draws a trapezium with sides in the correct ratio (e.g. 5 sq, 6 sq, 7.5 sq)
	I6	Improves drawing	2 or	AB	Right trapezium with at least 3 of: Base 10 sq lengths Side 12 sq lengths Side 15 sq lengths 2 right angles correctly placed
	I6	Fully correct scale drawing of the side view	3	ABC	Right trapezium with at all of: Base 10 sq lengths Side 12 sq lengths Side 15 sq lengths 2 right angles correctly placed
Total marks for question			3		

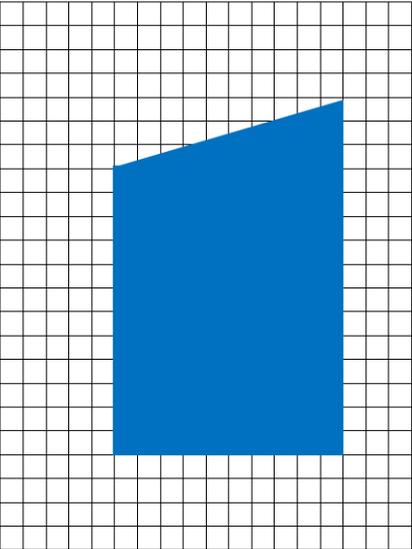
Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8	R1	Uses consistent units	1	D	E.g. 0.3 or 300 or 6700 or 670 or 4800 or 480 or 1.6 or 160 or 0.9 or 90 May be seen in subsequent calculations
	R3	Begins to find size of available roof space	1	E	'6700' - 2 × '300' (=6100) oe OR '4800' - 2 × '300' (=4200) oe
	A4	Process to find available roof space	1 or	F	'6100' ÷ 1600 (=3.8125) oe OR '4200' ÷ 900 (=4.66..) oe OR '6100' ÷ 900 (=6.77..) oe OR '4200' ÷ 1600 (=2.625) oe OR 1600 × 900(=1440000) oe OR '6100' × '4200'(=25620000) oe
	A4	Process to find number of panels	2 or	FG	'3' × '4' (=12) OR '6' × '2' (=12) OR 1600 × 900(=1440000) oe AND '6100' × '4200'(=25620000) oe OR 12 × '1440000' (=17280000) oe
	I7	Correct conclusion from valid working	3	FGH	Yes AND 12 (panels, from valid working)
Total marks for question			5		

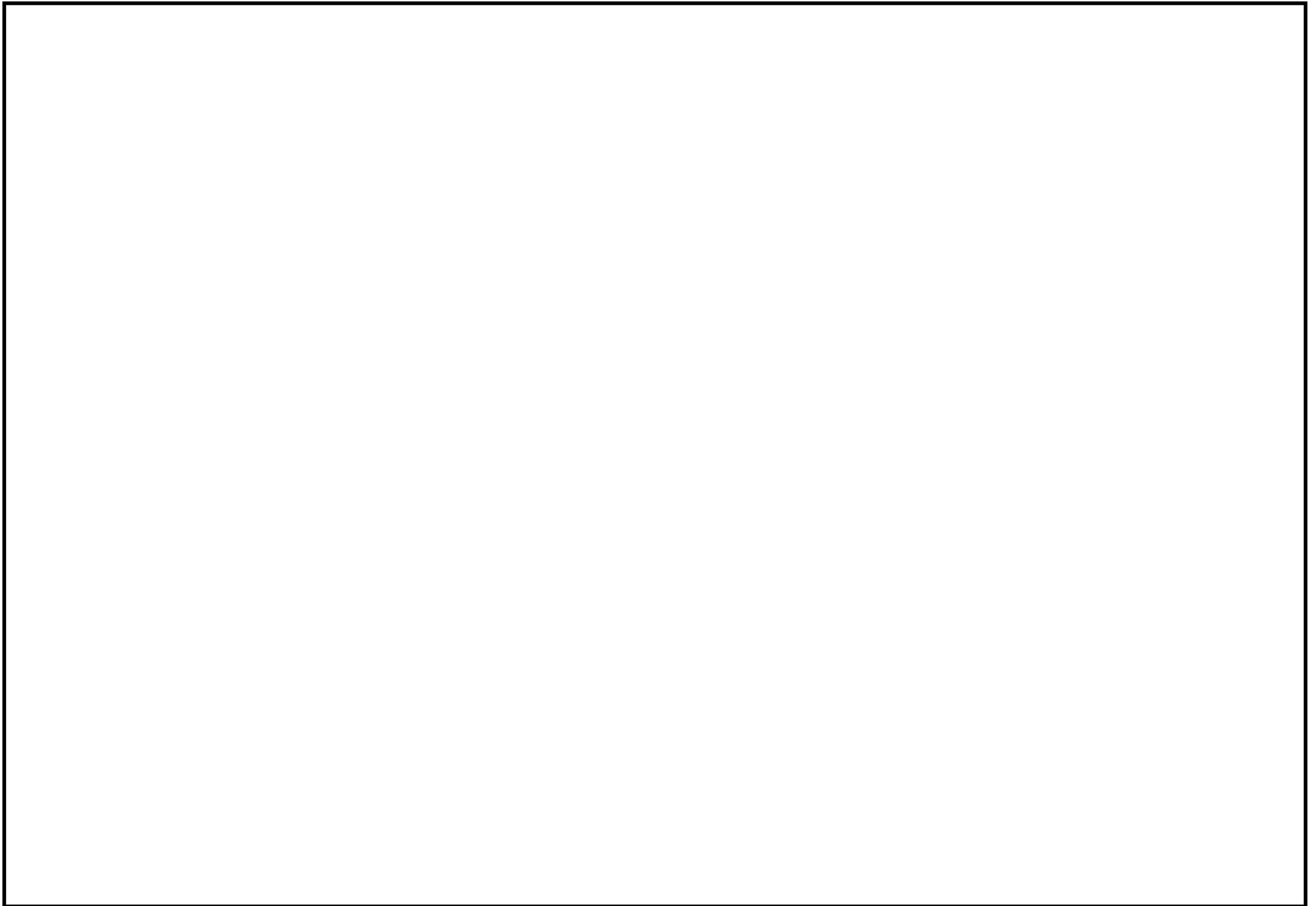
Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9	R2	Starts to process information	1	J	524.8 – 19.12(= 505.68) OR Uses 0.45 OR 240 ÷ ‘0.45’(=533.33..)
	A4	Process to use formula	1 or	K	(524.8 – 19.12) × ‘0.45’(=227.556) OR ‘533.33..’ + 19.12(=552.45..) OR ‘533.33..’ – 524.8(=8.53) OR 524.8 – 19.12(= 505.68) and 240 ÷ ‘0.45’(=533.33..)
	I7	Correct conclusion with accurate figures	2	KL	No and [227, 228] (W) OR No and 552(.45 m ² wall area) OR No and 8(.53 m ² window area) OR No and 505(.68 m ²) and 533(.33.. m ²)
Total marks for question			3		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q10(a)	R2	Selects correct answer applying criteria correctly	1	M	Indicates B or 9 or (£)26.45
Q10(b)	R3	Starts process to find figures to compare	1 or	N	E.g. $(14 - '9') \times 25 \times 365 (=45625)$ OR $(14 - '9') \times 25 \times 366 (= 45750)$ OR $14 \times 25 \times 365 \times 0.00297(=379.4175)$ OR $'9' \times 25 \times 365 \times 0.00297(=243.91125)$ OR $14 \times 25 \times 366 \times 0.00297(=380.457)$ OR $'9' \times 25 \times 366 \times 0.00297(=244.5795)$ OR $130 \div 365 (=0.356..)$ OR $(14 - '9') \times 25 (=125)$ OR $130 \div 0.00297 (=43771.04..)$ Allow use of 364
	A4	Full process to find figures to compare	2 or	NP	E.g. $'45625' \times 0.00297 (=135.50..)$ OR $'379.4175' - '243.91125' (=135.50..)$ OR $'45750' \times 0.00297 (=135.87..)$ OR $'380.457' - '244.5795' (=135.87..)$ OR $'125' \times 0.00297 (=0.371..)$ AND $130 \div 365 (=0.356..)$ OR $'45625' \text{ or } '45750' \text{ AND } 130 \div 0.00297 (=43771.04..)$
	I7	Correct conclusion with accurate figures	3	NPQ	E.g. Yes AND (£)[135, 136] OR Yes AND (£) 0.37(1.. per day) AND (£) 0.35(6.. per day) OR Yes AND 45625 or 45750 AND 43771(.04.. litres) NB Allow ft from their answer in M mark
	A5	Check	1	R	Valid estimation or alternative method or reverse calculations
Total marks for question			5		

answer to Q7

Scale 1:50





Ofqual



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