

**FUNCTIONAL SKILLS MATHEMATICS
MARK SCHEME – LEVEL 2 SET 7**

Marking Guidance for Functional Skills Mathematics Level 2

General

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme, the response should be escalated to a senior examiner to review.
- Mark schemes should be applied positively. Learners 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. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the learner's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated in the answer box, always check the working in the body of the script (and on any diagrams) and award any marks appropriate from the mark scheme.
- Working is always expected. For short questions, where working may not be seen, correct answers may still be awarded full marks. For longer questions, an answer in brackets from the mark scheme seen in the body of the working, implies a correct process and the appropriate marks may be awarded.
- **Questions that specifically state that working is required:** learners who do not show working will get no marks – full details will be given in the mark scheme for each individual question.

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 learner uses to reach an answer. The evidence column shows the *most likely* examples that will be seen. If the learner gives different evidence valid for the process, examiners should award the mark(s).
- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 work 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**, e.g. 528 instead of 523, may still gain process marks provided the question has not been simplified. Examiners should send any instance of a suspected misread to a senior examiner to review.
- It may be appropriate to **ignore subsequent work (isw)** when the learner's additional work does not change the meaning of their answer.

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- **Correct** working followed by an **incorrect decision** may be seen, showing that the learner 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 learner presents a correct answer in working and writes it incorrectly on the answer box e.g. 698 in the body and 689 in the answer box; mark the better answer if clearly only a transcription error. Examiners should send any instance of transcriptions errors to a senior examiner to review.
- **Incorrect method** if it is clear from the working that the correct answer has been obtained from incorrect working, award 0 marks. Examiners must escalate the response to a senior examiner to review.
- **Follow through marks (ft)** must only be awarded when explicitly allowed in the mark scheme. Where the process uses the learner'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 coming from a correct or set of correct processes.
 - When words are used in { } then this value does not need to come from a correct process but should be the value the learner believes to be required. The constraints on this value will be detailed in the mark scheme. For example, { volume } means the figure may not come from a correct process but is clearly the value learners believe should be used as the volume.
- Marks can usually be awarded where units are not shown. Where units are required this will be stated. For example, 5(m) indicates that the units do not have to be stated for the mark to be awarded.
- Learners 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, when a range of answers is given e.g. [12.5, 13] this is the inclusive closed interval.
- **Accuracy** of figures. Accept an answer which has been rounded or truncated from the correct figure unless other guidance is given. For example, for 12.66.. accept 12.6, 12.7, 12.66, 12.67 or any other more accurate figure.
- **Probability** answers must be given as a fraction, percentage or decimal. If a learner gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths). If a learner gives the answer as a percentage a % must be used. Incorrect notation should lose the accuracy marks but be awarded any implied process marks. If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.
- **Graphs.** 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. The minimum requirements will be given, but examiners should give credit if a title is given which makes the label obvious.

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Section A (Non-Calculator)

PMAT2/N07				
Question	Process	Mark	Mark Grid	Evidence
Q1(a)	Accurate figure	1	A	97
Q1(b)	Begins to subtract and shows a carry	1 or	B	e.g. $\begin{array}{r} 17.456 \\ - 6.072 \\ \hline (11.3)84 \end{array}$
	Accurate figure	2	BC	or $\begin{array}{r} 17.3456 \\ - 6.072 \\ \hline (11.3)84 \end{array}$ 11.384
Total marks for question		3		

Question	Process	Mark	Mark Grid	Evidence
Q2	Works with common denominator or improper fraction	1 or	A	e.g. $\frac{2}{6}$ or $\frac{17}{6}$ or $\frac{28}{3}$ oe
	Full process to add fractions	2 or	AB	e.g. $2 + 9 + \frac{5+2}{6} (=11\frac{7}{6})$ or $\frac{17+56}{6} (= \frac{73}{6})$ oe
	Accurate figure given as a mixed number	3	ABC	$12\frac{1}{6}$ oe NB this question requires working shown
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q3(a)	Begins to work with speed, distance or time	1 or	A	e.g. $60 \div 3 (= 20)$ OR $15 \times 3 (= 45)$ OR $15 \times 1.6 (= 24)$ OR $60 \div 1.6 (= 37.5)$
	Full process to find figures to compare	2 or	AB	e.g. $15 \times 1.6 (=24)$ and $60 \div 3 (= 20)$ OR $'24' \times 3 (= 72)$ OR $'37.5' \div 3 (= 12.5)$ OR $'20' \div 1.6 (= 12.5)$ OR $15 \times 3 (= 45)$ and $60 \div 1.6 (= 37.5)$
	Valid decision with accurate figures	3	ABC	e.g. Yes AND 24 (km/h) and 20 (km/h) OR Yes AND 72 (km in 3 hours) OR Yes AND 12.5 (mph) OR Yes AND 45 (miles in 3 hours) and 37.5 (miles in 3 hours)
Q3(b)	Valid check	1	D	e.g. $15 \times 2 = 30$ or $72 \div 3 = 24$
Total marks for question		4		

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Question	Process	Mark	Mark Grid	Evidence
Q4	Begins process to find the area of triangle	1 or	A	e.g. $24 \times 27 (= 648)$ OR $24 \div 2 (= 12)$ $27 \div 2 (= 13.5)$
	Full process to find the area of triangle	2	AB	'648' $\div 2 (= 324)$ oe OR '12' $\times 27 (= 324)$
	Process to find the volume of concrete	1 or	C	{area} $\times 0.3 (=97.2)$ oe
	Begins the process to divide by 6	2 or	CD	e.g. '97.2' $\div 6 (= 16.2)$
	Full process to find the number of trucks needed (must use decimal division)	3 or	CDE	e.g. $ \begin{array}{r} 16.2 \\ 6 \overline{) 97.2} \\ \underline{6} \\ 37 \\ \underline{36} \\ 12 \\ \underline{12} \\ 0 \end{array} $
Accurate figure from correct working	4	CDEF	17	
Total marks for question		6		

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Section B (Calculator)

PMAT2/C07				
Question	Process	Mark	Mark Grid	Evidence
Q1	Begins to work with formula	1 or	A	e.g. $2.9 + 7.15 (= 10.05)$ OR $\frac{3 (\times)(2.9 + 7.15)}{6}$
	Full process to find value of K	2 or	AB	e.g. $3 \times '10.05' \div 6 (= 5.025)$
	Accurate figure	3	ABC	5.025
Total marks for question		3		

Question	Process	Mark	Mark Grid	Evidence
Q2	Begins to work with mean or identifies median	1 or	A	$(12.9 + 14.3 + 14.1 + 13.0 + 13.2 + 13.9 + 13.1) \div 7 (= 13.5)$ OR 13.2 (identified as median)
	Full process to find both statistical measures to compare	2 or	AB	$(12.9 + 14.3 + 14.1 + 13.0 + 13.2 + 13.9 + 13.1) \div 7 (= 13.5)$ AND 13.2 (identified as median)
	Valid explanation with accurate figures	3	ABC	e.g. They both could be correct because Shona's mean score of 13.5 is greater than Erica's but her median score of 13.2 is lower than Erica's NB Ignore working with range for marks A and AB NB2 this question requires working shown
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q3	Process to find weekly number of clicks	1	A	650.25 ÷ 0.85 (= 765) OR '936.36' ÷ 0.85 (= 1101.6)
	Begins to work with compound percentage increase	1 or	B	e.g. '765' × $\frac{100+20}{100}$ (= 918) OR $(\frac{100+20}{100})^2$ (=1.44) OR 0.8 ² (=0.64) OR 1000 × 0.8 (= 800) OR 650.25 + 650.25 ÷ 100 × 20 (= 780.3)
	Full process to find figures to compare	2 or	BC	e.g. '765' × '1.2' ² (= 1101.6) OR 1000 × 0.8 ² (= 640) OR 650.25 × '1.2' ² (= 936.36) Condone working with 3 weeks
	Valid decision with accurate figures	3	BCD	Yes AND 1101(.6) or 1102 OR Yes AND 640 and 765
Total marks for question		4		

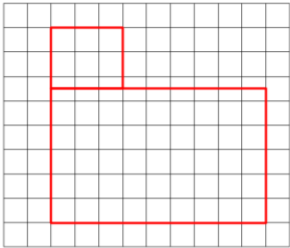
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Question	Process	Mark	Mark Grid	Evidence
Q4(a)	Describes the relationship	1	A	e.g. (weak) negative correlation or no correlation OR The greater the age of the patient the shorter the waiting time
Q4(b)	Begins to identify the relevant figures Accurate figure	1 or 2	B BC	Identifies 6 and 9 OR $\frac{a}{9}$ where $a < 9$ or $\frac{6}{b}$ where $b > 6$ $\frac{6}{9}$ oe
Total marks for question		3		

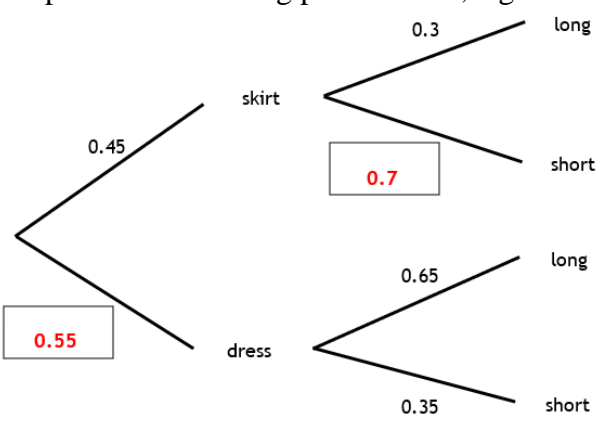
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Question	Process	Mark	Mark Grid	Evidence
Q5(a)	Process to work with number of boxes and proportion	1	A	e.g. $(120 \div 30) \times 65 (= 260)$ OR $(120 \div 30) \times '54.6' (= 218.4)$ OR $200 \div (120 \div 30) (= 50)$ OR $200 \div '54.6' (= 3.66..)$ and $120 \div 30 (= 4)$
	Begins to work with percentage	1 or	B	e.g. $'260' \times 16 \div 100 (= 41.6)$ OR $65 \times 16 \div 100 (= 10.4)$ OR $(100 - 16) \div 100 (= 0.84)$ OR
	Full process to work the percentage	2 or	BC	e.g. $'260' \times '0.84' (= 218.4)$ OR $65 \times '0.84' (= 54.6)$ OR $200 \div '0.84' (= 238.09..)$
	Valid decision with accurate figure	3	BCD	e.g. No AND (£)218(.40) OR No AND (£)50 and (£)54(.6) OR No AND (£)238(.09..) OR No AND 4 and 3(.66.. boxes)
Q5(b)	Valid check using reverse calculation	1	E	e.g. $4 \times 30 = 120$
Total marks for question		5		

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Question	Process	Mark	Mark Grid	Evidence
Q6	Begins to work with scale or front view	1 or	A	e.g. A sketch of a front elevation (not to scale and/or by hand not on the grid) OR Rectangle 9 cm by 5.5 cm OR Rectangle 3 cm by 2.5 cm OR Vertical height 8 cm in length or 8 sq stated or implied OR At least 2 of 9 sq, 5.5 sq, 3 sq, 2.5 sq stated
	Develops solution	2 or	AB	e.g. A correct front elevation to a different scale or with one error in dimensions OR Rectangle 9 cm by 5.5 cm and rectangle 3 cm by 2.5 cm not connected along one side or in incorrect position
	Accurate elevation	3	ABC	Correct front elevation 
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q7(a)	<p>Begins to complete the tree diagram</p> <p>Fully complete tree diagram</p>	<p>1 or</p> <p>2</p>	<p>A</p> <p>AB</p>	<p>Completes one of the missing probabilities</p> <p>Completes both missing probabilities, e.g.</p> 
Q7(b)	<p>Begins to work with probability</p> <p>Accurate figure</p>	<p>1 or</p> <p>2</p>	<p>C</p> <p>CD</p>	<p>$0.45 \times 0.3 (= 0.135)$</p> <p>0.135 oe</p>
Total marks for question		4		

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Question	Process	Mark	Mark Grid	Evidence
Q8	Process to multiply a consistent value of number of workers by frequency	1 or	A	e.g. 2 of 8×5.5 or 14×15.5 or 5×25.5 or 3×35.5 Allow use of 'midpoints' provided they are consistent and within an interval including the end points OR 2 of 44 and 217 and 127.5 and 106.5 seen
	Full process to find the estimate of the mean	2	AB	$(8 \times 5.5 + 14 \times 15.5 + 5 \times 25.5 + 3 \times 35.5) \div (8 + 14 + 5 + 3) (=16.5)$ (condone 1 error) Allow use of 'midpoints' provided they are consistent and within an interval including the end points
	Begins to work with percentage increase or develops mean	1 or	C	e.g. {estimated mean} $\times 12.5 \div 100 (= 2.0625)$ OR $(100 + 12.5) \div 100 (= 1.125)$ OR {estimated mean} $\times 130 (= 2145)$ OR {estimated mean} $\times 31 (= 511.5)$ OR {estimated mean} $\times 130 \times 31 (= 66495)$ OR $130 \times 31 \times 12.5 \div 100 (= 503.75)$
	Develops solution	2 or	CD	e.g. '16.5' + '2.0625' (= 18.5625) OR '1.125' \times {estimated mean} (= 18.5625) OR {estimated mean} $\times 130 \times 12.5 \div 100 (= 268.125)$ OR {estimated mean} $\times 31 \times 12.5 \div 100 (= 63.9375)$ OR {estimated mean} $\times 130 \times 31 \times 12.5 \div 100 (= 8311.875)$ OR $130 \times 31 + '503.75' (= 4533.75)$
	Full process to find the total income	3 or	CDE	e.g. '18.5625' $\times 31 \times 130 (=74806.875)$ OR {estimated mean} $\times 130 \times '1.125' \times 31 (= 74806.875)$ OR {estimated mean} $\times 31 \times '1.125' \times 130 (= 74806.875)$ OR '4533.75' $\times '16.5' (= 74806.875)$ OR '66495' + '8311.875' (= 74806.875)
Accurate figure given in pounds or pounds and pence	4	CDEF	e.g. 74806 or 74807 or 74806.87 or 74806.88 NB this question requires working shown	
Total marks for question		6		

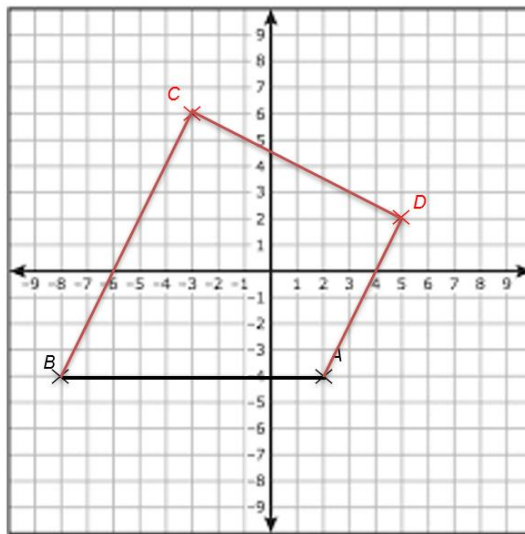
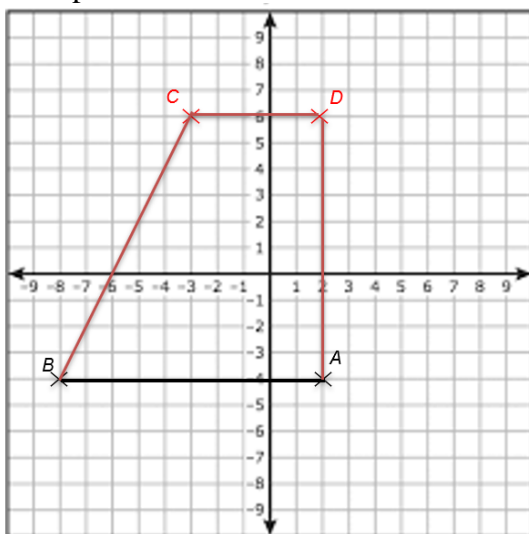
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Question	Process	Mark	Mark Grid	Evidence
Q9	Begins to work with inverse proportion	1 or	A	e.g. $23 \times 4 (= 92)$ OR $4 \div 3 (= 1.33..)$ OR $3 \div 4 (= 0.75)$ OR $23 \div 3 (= 7.66..)$
	Full process to find total staff needed	2 or	AB	e.g. $'92' \div 3 (= 30.66..)$ OR $23 \times '1.33..' (= 30.66..)$ OR $23 \div '0.75' (= 30.66..)$ OR $'7.66..' \times 4 (= 30.66..)$
	Accurate figure	3	ABC	31
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q10(a)	Plots accurately	1	A	Point <i>C</i> plotted at $(-3, 6)$
Q10(b)	Begins to engage with the shape of trapezium or a right angle in a quadrilateral	1 or	B	Point <i>D</i> plotted along one of the lines $x = 2$ or $y = 6$ OR $y = -0.5x + 4.5$ or $y = 2x - 8$
	Fully correct shape plotted	2	BC	Point <i>D</i> plotted at $(2, 6)$ OR Point <i>D</i> plotted at $(5, 2)$ Condone point plotted at $(-8, 6)$
Total marks for question		3		

Example answers



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Question	Process	Mark	Mark Grid	Evidence
Q11	Process to use consistent units	1	A	e.g. '396' ÷ 3.3 (=120) or 93.5 ÷ 3.3 (= 28.33..) OR 5 × 3.3 (= 16.5)
	Full process to find perimeter of the lawn	1	B	93.5 + 63 + 93.5 + 63 + 41.5 + 41.5 (= 396) or '28.33..' × 2 + '19.09..' × 2 + '12.57..' × 2 (= 120) or
	Full process to work with the number of lengths of edging	1	C	e.g. {perimeter in metres} ÷ 5 (= 24) OR {perimeter in feet} ÷ '16.5' (= 24) OR '25(.64)' × 5 (=125)
	Full process to find figures to compare	1 or	D	e.g. '24' × 38.99 (= 935.76) OR 1000 ÷ 38.99 (= 25.64..) OR 1000 ÷ '24' (= 41.66...)
	Valid decision with accurate figures	2	DE	e.g. Yes AND (£)935(.76) OR Yes AND 24 and 25(.64..) OR Yes AND 120 and 125 OR Yes AND (£)41(.66...)
Total marks for question		5		

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Question	Process	Mark	Mark Grid	Evidence
Q12(a)	Correct answer	1	A	7430900
Q12(b)	Begins to work with ratio	1 or	B	$17424 \div (3 + 5) (= 2178)$
	Full process to work with ratio	2	BC	$17424 \div (3 + 5) \times 3 (= 6534)$ oe
	Process to work with percentage	1	D	e.g. $19500 \times 39 \div 100 (= 7605)$
	Full process to find figures to compare	1 or	E	e.g. '7605' – '6534' (= 1071) OR '6534' + 1200 (= 7734) OR '7605' – 1200 (= 6405)
	Valid decision with accurate figures	2	EF	e.g. No AND 1071 OR No AND 7734 and 7605 OR No AND 6405 and 6534
Total marks for question		6		