

**PEARSON EDEXCEL FUNCTIONAL SKILLS MATHEMATICS
MARK SCHEME – LEVEL 2 SET 3**

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- If working **is crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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/N03				
Question	Process	Mark	Mark Grid	Evidence
Q1	Begins to work with proportion	1 or	A	e.g. 4 (ounces), $3 \div 2 (=1.5)$ (butter) or 2 (ounces), $3 \div 4 (=0.75)$ (butter) OR $20 \div 8 (=2.5)$ OR $8 \div 3 (=2.66..)$
	Full process to find the total amount of butter required	2 or	AB	e.g. $3 + 3 + '1.5' (=7.5)$ oe OR $3 \times '2.5' (=7.5)$ OR $20 \div '2.66..' (=7.5)$
	Accurate figure	3	ABC	7.5
Total marks for question		3		

Question	Process	Mark	Mark Grid	Evidence
Q2(a)	Accurate figure	1	A	11
Q2(b)	Begins to evaluate formula	1 or	B	$5 \times \sqrt{16}$ OR $\sqrt{16} = 4$ condone $\sqrt{16} = -4$
	Accurate figure	2	BC	20 Condone -20 or ± 20
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q3(a)	Begins to work with fraction	1 or	A	$\frac{5}{8} \times 320$ OR $320 \div 8 (=40)$
	Accurate figure	2	AB	200
Q3(b)	Process to work with ratio	1 or	C	$\frac{24}{(13 + 24 + 15)}$
	Accurate figure (given as a fraction in its simplest form)	2	CD	$\frac{6}{13}$
Total marks for question		4		

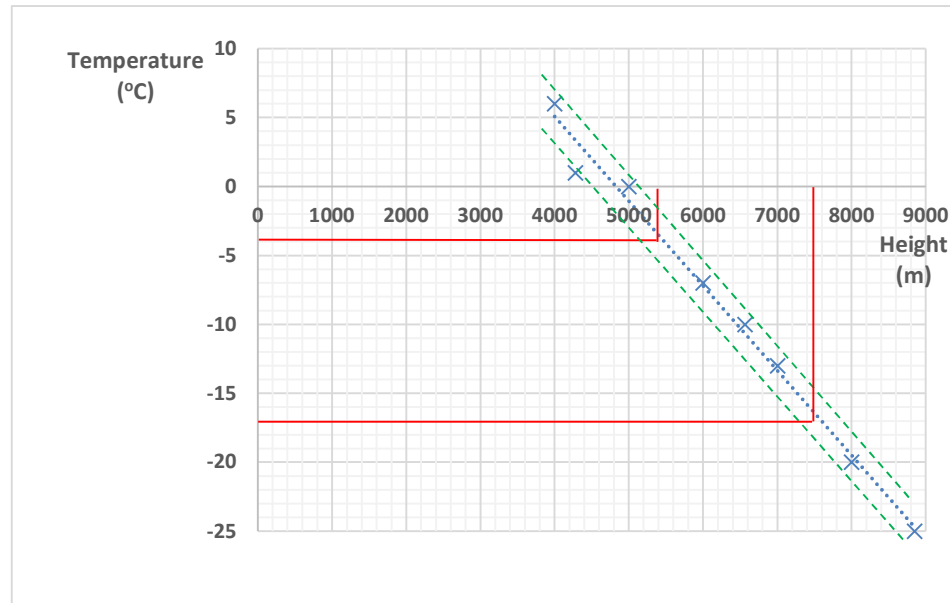
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Question	Process	Mark	Mark Grid	Evidence
Q4(a)	Begins process to calculate total cost of payment plan	1 or	A	$12 \times 15 (=180)$
	Full process to calculate cost of payment plan	2	AB	$36 + (12 \times 15) (=216)$
	Begins to work with percentage or discount	1 or	C	$8 \div 100 \times 240(=19.2)$ OR $240 - '216' (=24)$ OR $('216' \div 240) \times 100 (= 90)$ OR
	Full process to find figures to compare	2 or	CD	$240 - '19.2' (=220.8)$ and $36 + (12 \times 15) (=216)$ OR $'19.2' + '216' (=235.2)$ OR $(240 - '216') \div 240 \times 100 (=10)$ OR $100 - '90' (=10)$ OR $240 - '216' (=24)$ and $8 \div 100 \times 240(=19.2)$ OR $('216' \div 240) \times 100 (= 90)$ and $100 - 8 (=92)$ OR $36 + (12 \times 15) (=216)$ and $92 \div 100 \times 240(=220.8)$
	Valid decision with accurate figures	3	CDE	No AND 220.8 and 216 OR No AND 235.2 OR No AND 10 OR No AND 24 and 19.2 OR No AND 90 and 92
Q4(b)	Valid check for cost of payment plan	1	F	e.g. $12 \times 15 + 40 = 220$ or $10 \times 15 + 40 = 190$ or $220 - 180 = 40$
Total marks for question		6		

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Section B (Calculator)

PMAT2/C03				
Question	Process	Mark	Mark Grid	Evidence
Q1(a)	Correct description of relationship	1	A	e.g. negative correlation (between temperature and height) OR the higher you get the lower the temperature
Q1(b)	Process to interpret scatter diagram	1 or	B	Reads off graph at appropriate points OR '-17' – '-4' (= -13)
	Figure within range	2	BC	12 to 14 Accept negative or positive difference
Total marks for question		3		



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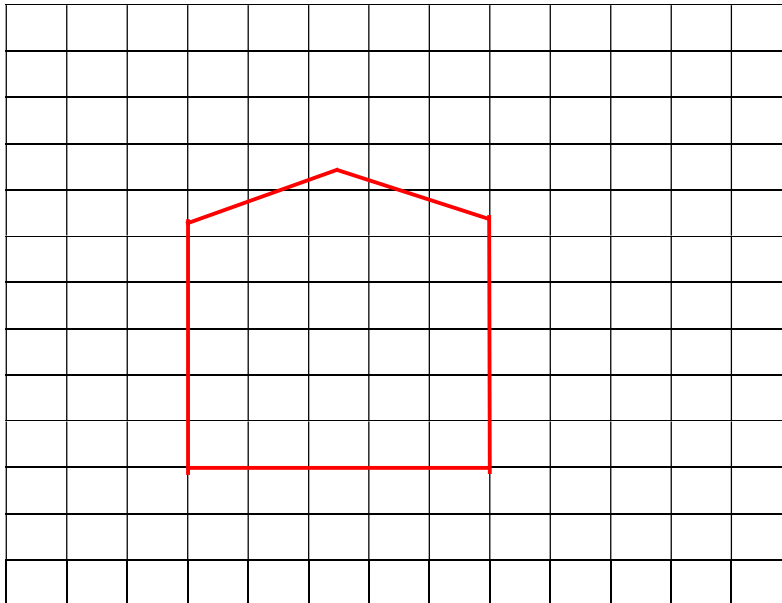
Question	Process	Mark	Mark Grid	Evidence
Q2(a)	Full process to find figures to compare	1 or	A	e.g. '66 900 000' ÷ 242 500 (=275.87..) OR 300 × 242 500 (=72750 000) OR '66 900 000' ÷ 300 (=223 000)
	Valid decision with accurate figure	2	AB	No AND 275(.87..) (people per square kilometre) OR No AND 72750 000 oe (population) OR No AND 223 000 (square kilometres)
Q2(b)	Valid check	1	C	e.g. $275 \times 242500 = 66687500$
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q3	Process to work with proportion	1 or	A	e.g. $520 \div 28 (=18.57..)$ (gallons) OR $100 \div '1.284' (=77.88..)$ (litres) OR $128.4 \times 4.55 (=584.22)$
	Develops solution	2 or	AB	e.g. $'18.57..' \times 4.55 (=84.5)$ (litres) OR $'77.88..' \div 4.55 (17.11..)$ (gallons) OR $128.4 \times 4.55 (=584.22)$ and $520 \div 28 (=18.57..)$ (gallons)
	Full process to find figures to compare	3 or	ABC	e.g. $'84.5' \times 128.4 (=10849.8)$ OR $520 \div 28 (=18.57..)$ and $'77.88..' \div 4.55 (17.11..)$ OR $100 \div '1.284' (=77.88..)$ and $'18.57..' \times 4.55 (=84.5)$ OR $'584.22' \times '18.57..' (=10849.8)$
	Valid decision with accurate figures	4	ABCD	e.g. Yes AND (£)108(.498) OR Yes AND 18(.57..) and 17(.11..) (gallons) Yes AND 77(.88..) and 84(.5) (litres)
Total marks for question		4		

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Question	Process	Mark	Mark Grid	Evidence
Q4	Begins to work with scale	1 or	A	e.g. $130 \div 20 (=6.5)$ OR One of: Base line 5 sq lengths, side height 5.5 sq lengths, overall height 6.5 sq lengths
	Begins to draw front elevation	2 or	AB	Pentagon with two of: Base line 5 sq lengths, side height 5.5 sq lengths, overall height 6.5 sq lengths
	Correct front elevation	3	ABC	Pentagon with all sides correct and one line of symmetry
Total marks for question		3		



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Question	Process	Mark	Mark Grid	Evidence
Q5(a)	Process to multiply a consistent value of test mark by frequency	1 or	A	e.g. 3×20 or 8×50 or 13×120 or 18×60 Allow use of ‘midpoints’ provided they are consistent and within an interval including the end points OR 60 and 400 and 1560 and 1080 seen (condone 1 error or omission)
	Full process to find an estimate of the mean	2 or	AB	$(3 \times 20 + 8 \times 50 + 13 \times 120 + 18 \times 60) \div (20 + 50 + 120 + 60)$ (=12.4) Allow use of ‘midpoints’ provided they are consistent and within an interval including the end points
	Valid decision and accurate figure	3	ABC	Yes/No AND 12.4
Q5(b)	Process to find range	1 or	D	$17 - 2$ (=15) and $18 - 5$ (=13)
	Valid comparison with accurate figures	2	DE	(Range Oct =) 15 and (range Nov =)13 AND e.g. The range in Nov was less than the range in Oct OR the marks in Nov are closer together/less spread out/more consistent than the marks in Oct as the range is smaller
Total marks for question		5		

Number of marks	Frequency	Mid-point	Frequency × mid-point
1-5	20	3	60
6-10	50	8	400
11-15	120	13	1560
16-20	60	18	1080
	250		3100

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Question	Process	Mark	Mark Grid	Evidence
Q6	Begins to work with percentages	1 or	A	$810 \div 960 \times 100 (=84.375)$ OR $18 \div 100 \times 960 (=172.8)$
	Full process to find figures to compare	2 or	AB	$100 - '84.375' (=15.625)$ OR $(960 - 810) \div 960 \times 100 (=15.625)$ OR $18 \div 100 \times 960 (=172.8)$ and $960 - 810 (=150)$
	Valid decision with accurate figure	3	ABC	No AND $15(.625) (\%)$ OR No AND $172(.8)$ and 150
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q7(a)	Begins to complete sample space table	1 or	A	Correctly fills 4, 5 or 6 cells
	Fully accurate figures in table	2	AB	Correct cells in the table, see solution below
Q7(b)	Correct explanation	1	C	e.g. 0.5 is 50% OR 5% is 0.05
Q7(c)	Accurate figure	1	D	$\frac{1}{16}$ oe
Total marks for question		4		

Card 1

Card 2

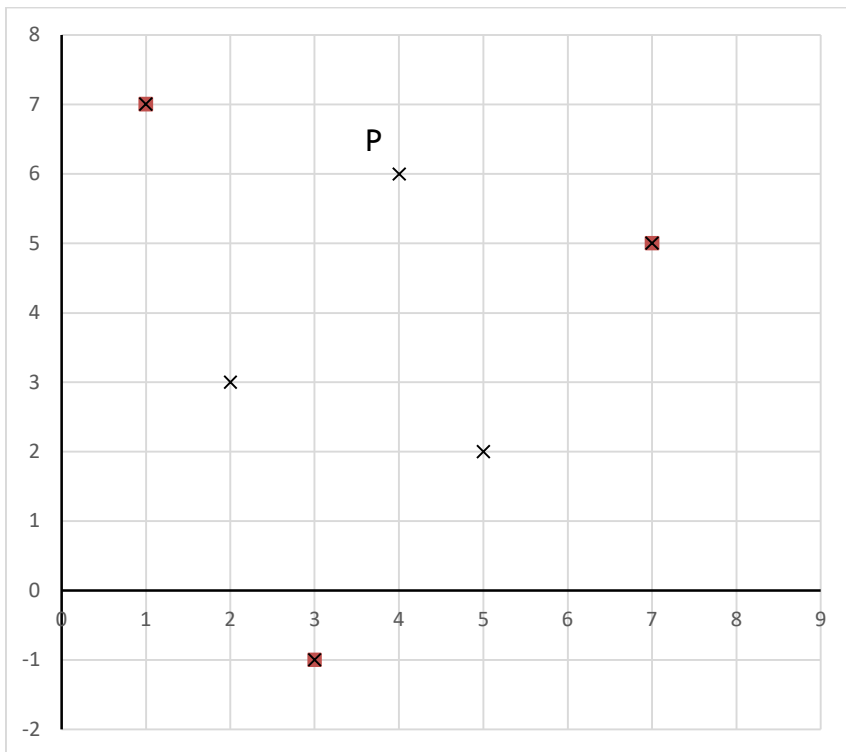
×	-5	7	-9	11
2	-10	14	-18	22
4	-20	28	-36	44
-6	30	-42	54	-66
8	-40	56	-72	88

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Question	Process	Mark	Mark Grid	Evidence
Q8	Process to find missing length	1 or	A	$30 \times 2 (=60)$ OR $2 \times \pi \times 30 (=188.4..)$ oe may be seen in subsequent working
	Begins to work with perimeter	2 or	AB	e.g. $85 + '60' + 85 (=230)$ OR $30 \times 2 (=60)$ and $2 \times \pi \times 30 (=188.4..)$ oe
	Works with perimeter of straight edges and curved edge	3 or	ABC	$85 + '60' + 85 (=230)$ and $(2 \times \pi \times 30) \div 2 (=94.2 ..)$ oe
	Full process to find total perimeter	4	ABCD	'230' + '94.2..' (=324.2..)
	Full process to work with fraction	1 or	E	$500 \div 3 \times 2 (= 333.3..)$ OR '324.2' $\div 2 \times 3 (=486.3..)$
	Valid decision with accurate figures	2	EF	No AND 324(.2..) and 333(.3..) (cm) OR No AND 486(.3) (cm)
Total marks for question		6		

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Question	Process	Mark	Mark Grid	Evidence
Q9(a)	Accurate coordinates for P	1	A	(4, 6)
Q9(b)	Plots a suitable point or gives correct coordinates	1 or	B	e.g. (7, 5) or (1, 7) or (3, -1) plotted or written
	Plots a suitable point and gives correct coordinates	2	BC	e.g. (7, 5) or (1, 7) or (3, -1) plotted and written
Total marks for question		3		



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Question	Process	Mark	Mark Grid	Evidence
Q10	Starts to work with inverse proportion	1 or	A	$6 \times 2 (=12)$
	Complete process	2 or	AB	$6 \times 2 \div 3 (=4)$
	Accurate figure	3	ABC	4
Total marks for question		3		

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Question	Process	Mark	Mark Grid	Evidence
Q11	Process to work with median	1	A	e.g. $(1 + 2) \div 2 (=1.5)$ OR $(\text{'311.875'} + \text{'623.75'}) \div 2 (=467.8125)$
	Begins to work with percentage or finds total of weekly sales	1 or	B	$0.0125 \times 20\,950 (=261.875)$ oe OR $(2 + 0 + 1 + 4 + 1 + 2) \times 20\,950 (=209500)$ oe
	Develops solution	2 or	BC	$\text{'261.875'} + 50 (=311.875)$ OR $\text{'1.5'} \times 0.0125 \times 20\,950 (=392.8125)$ OR $(2 + 0 + 1 + 4 + 1 + 2) \times 0.0125 \times 20\,950 (=2618.75)$ oe
	Full process to find median rate of pay per day	3 or	BCD	e.g. $\text{'311.875'} \times 1.5 (=467.8125)$ OR $\text{'392.8125'} + \text{'1.5'} \times 50 (=467.8125)$
	Accurate figure	4	BCDE	467.81 or 467.82 or 468
Total marks for question		5		

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Question	Process	Mark	Mark Grid	Evidence
Q12	Process to find out a missing length	1	A	$10.2 - 4.5 (=5.7)$ OR $7.7 - 4 (=3.7)$
	Process to find out one relevant area	1 or	B	e.g. $4.5 \times 4 (=18)$ OR $10.2 \times 4 (=40.8)$ OR $4.5 \times '3.7' \div 2 (=8.325)$ OR $7.7 \times '5.7' (=43.89)$ OR $'3.7' \times '5.7' (=21.09)$ OR $10.2 \times 7.7 (=78.54)$ OR $4 \times '5.7' (=22.8)$
	Full process to work out floor area	2	BC	e.g. $'18' + '43.89' + '8.325' (=70.215)$ OR $'40.8' + '21.09' + '8.325' (=70.215)$ OR $'78.54' - '8.325' (=70.215)$
	Process to work out number of packs (allow for a relevant area)	1 or	D	e.g. $'70.215' \div 0.945 (=74.30..)$ oe
	Full process to work out total cost using rounded up value (allow ft 'packs' provided area is used)	2 or	DE	e.g. $'75' \times 16.15 (=1211.25)$
	Accurate figure	3	DEF	1211.25
Total marks for question		6		