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 question 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- If working **is crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 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**, 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.

- **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.

Section A (Non-Calculator)

PMAT2/N02				
Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q1(a)	Orders decimals	1 or	A	10.91, 10.94, 11.05, 11.12, 11.12
	Accurate figure	2	AB	11.05
Q1(b)	Accurate figure	1	C	11.12
	Total marks for question	**3**		

Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q2	Process to square	1	A	e.g. 10×10 (=100) **OR** 8×8 (=64)
	Begins to work with formula	1 or	B	'100' – '64' (=36) **OR** $\sqrt{'10 \times 10' - '8 \times 8'}$ where 1 of the terms is correct
	Accurate figure	2	BC	6 Accept ± 6
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q3	Process to find a fraction of an amount or fraction over a common denominator	1 or	A	$\frac{1}{3} \times 240$ (=80) **OR** $\frac{1}{8} \times 240$ (=30) **OR** $\frac{8}{24}$ **or** $\frac{9}{24}$ used oe
	Improves solution	2 or	AB	$\frac{3}{8} \times 240$ (=90) **and** $\frac{1}{3} \times 240$ (=80) **OR** $1 - (\frac{8}{24} + \frac{9}{24})$ $(= \frac{7}{24})$ oe
	Full process to find required figure	3 or	ABC	$240 - \text{'90'} - \text{'80'}$ (=70) **OR** $\text{'}\frac{7}{24}\text{'} \times 240$ (=70)
	Accurate figure	4	ABCD	70
Total marks for question		**4**		

Question	Process	Mark	Mark Grid	Evidence
Q4	Converts units	1	A	4 **or** 0.6 **or** 0.5 seen May be seen or used in subsequent calculations.
	Process to find the area of one face	1 or	B	'4' × '0.6' (=2.4) **OR** '4' × '0.5' (=2)
	Process to find the area of two different shape faces or adds the area of at least one rectangular face to the area of both triangular faces	2 or	BC	'4' × '0.6' (=2.4) **and** '4' × '0.5' (=2) **OR** e.g. '4' × '0.5' + 0.12 + 0.12 (=2.24)
	Complete process to find total surface area for all 5 faces in consistent units.	3	BCD	e.g. '2.4' + '2' + 0.12 + '2' + 0.12 (=6.64)
	Process to find amount of paint required for 3 boards or coverage available	1 or	E	e.g. {surface area} × 3 (=19.92) **OR** 2 × 10 (=20) **OR** 2 × 10 ÷ 3 (=6.66..)
	Valid decision with accurate figures	2	EF	Yes **AND** 19.92 (m²) **and** 20 (m²) **OR** Yes **AND** 6.64 (m²) **and** 6.66(6..) (m²)
Total marks for question		**6**		

Section B (Calculator)

PMAT2/C02				
Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q1	Begins to work with conversion factor	1 or	A	e.g. 19 × 2.54 (=48.26) **or** 22 × 2.54 (=55.88) **OR** 47.2 ÷ 2.54 (=18.58) **or** 49.4 ÷ 2.54 (=19.4)
	Process for 2 correct and appropriate conversions	2 or	AB	e.g. 19 × 2.54 (=48.26) **and** 22 × 2.54 (=55.88) **OR** 47.2 ÷ 2.54 (=18.58) **and** 49.4 ÷ 2.54 (=19.4)
	Valid decision with accurate figures	3	ABC	Selects Fridge A **AND** correct conversions seen to allow selection of fridge A
Total marks for question	**3**			

fridge	Width cm	Depth cm	Height cm
GAP	48.26	55.88	91.44

fridge	Width inch	Depth inch	Height inch
A	18.582..	17.559..	33.149..
B	19.448..	17.559..	33.031..
C	18.307..	17.559..	37.086..

Question	Process	Mark	Mark Grid	Evidence
Q2(a)	Accurate coordinates	1	A	(1, −1)
Q2(b)	Accurate coordinates to form parallelogram	1	B	Plots D at (−3, −4) **OR** (−1, 6) **or** (5, 2)
Q2(c)	Accurate value	1	C	360
Total marks for question		**3**		

Question	Process	Mark	Mark Grid	Evidence
Q3	Begins process to find the median or mean day rate	1 or	A	75, 84, 89, 115, 120, 290, 298 in order **OR** (290 + 75 + 115 + 84 + 120 + 89 + 298) ÷ 7 (=153)
	Process to find the median and mean	2	AB	75, 84, 89, 115, 120, 290, 298 in order **and** (290 + 75 + 115 + 84 + 120 + 89 + 298) ÷ 7 (=153)
	Accurate figure for median or mean	1 or	C	115 (median) **OR** (290 + 75 + 115 + 84 + 120 + 89 + 298) ÷ 7 =153 (mean) If this mark is awarded, award A
	Accurate figure for both median and mean with label or comment	2	CD	e.g. Median 115 **AND** mean (75 + 84 + 89 + 115 + 120 + 290 + 298) ÷ 7 =153 If this is seen, award all marks
Total marks for question		**4**		

Question	Process	Mark	Mark Grid	Evidence
Q4(a)	Works with percentage	1 or	A	e.g. 27 ÷ 123 × 100 (=21.95..) **OR** 24 ÷ 100 × 123 (=29.52) 123 × 1.24 (=152.52)
	Valid decision with accurate figures	2	AB	e.g. No **AND** 21(.95..) **or** 22(%) **OR** No **AND** 29 **or** 30 (people) **OR** No **AND** 152(.5) (total students)
Q4(b)	Valid check by reverse calculation	1	C	Valid check by reverse calculation e.g 21.95 ÷ 100 × 123 = 27 or 26.99.. 22 ÷ 100 = 0.22 with 0.22 × 100 = 22 seen in (a)
Total marks for question		**3**		

Question	Process	Mark	Mark Grid	Evidence
Q5(a)	Begins to complete two-way table	1 or	A	2 of: 62 – 38 (=24) 400 – 227 (=173) 21 + 23 (=44) **OR** 21 + 2 (=44) **and** 400 – 198 – 62 – '44' (=96)
	Improves solution	2 or	AB	400 – 198 – 62 – '44' (=96) **and** '173' – 40 – 21 – '24' (=88) **OR** '96' – 40 (=56) **and** 227 – '56' – 23 – 38 (=110)
	Fully correct table	3	ABC	Fully correct table. See below.
Q5(b)	Begins to deal with probability	1 or	D	$\frac{a}{400}$ where $a < 400$ **or** $\frac{23}{b}$ where $b > 23$
	Accurate figure	2	DE	$\frac{23}{400}$ oe
Total marks for question		**5**		

	shops	free parking	food court	location	total
male	**88**	**24**	40	21	**173**
female	**110**	38	**56**	23	227
total	198	62	**96**	**44**	400

Question	Process	Mark	Mark Grid	Evidence
Q6	Begins process to work with an estimate of the mean	1 or	A	e.g. 3 × 2 **and** 8 × 12 **and** 13 × 9 **and** 18 × 3 Allow use of 'midpoints' provided they are within the interval including the end points **OR** 6 **and** 96 **and** 117 **and** 54 seen (condone 1 error or omission) **OR** 26 × 10 (=260)
	Full process to find figures to compare	2 or	AB	e.g.(3 × 2 + 8 × 12 + 13 × 9 + 18 × 3) ÷ (2 + 12 + 9 + 3) (= 10.5) oe Allow use of 'midpoints' provided they are within the interval including the end points **OR** 26 × 10 (=260) **and** '6' + '96' + '117' + '54' (=273)
	Valid decision with accurate figure	3	ABC	e.g. Yes/No **AND** 10.5 **OR** No **AND** 260 and 273
Total marks for question	**3**			

number of cars sold each week	frequency	*x*	*fx*
1−5	2	3	6
6−10	12	8	96
11−15	9	13	117
16−20	3	18	54
totals	26	42	273

number of cars sold each week	*fx* using lower endpoint	*fx* using upper endpoint
1−5	2	10
6−10	72	120
11−15	99	135
16−20	48	60
totals	221	325

Question	Process	Mark	Mark Grid	Evidence
Q7(a)	Process to calculate volume	1 or	A	'6' × '4' × '3' (=72) May use dimensions clearly labelled on the diagram
	Accurate figure	2	AB	72
Q7(b)	Begins to draw the plan of the cuboid	1 or	C	Draws a rectangle of side length 6 squares **or** 4 squares
	Accurate plan	2	CD	Draws a rectangle of side length 6 squares **and** 4 squares NB Nets or 3D shapes **OR** rectangles labelled with front or side scores no marks
Total marks for question	**4**			

Question	Process	Mark	Mark Grid	Evidence
Q8(a)	Begins to work with ratio	1 or	A	$180 ÷ (6 + 2 + 1)$ (=20) **OR** Build up method to at least 60 : 20 : 10
	Process to find number of footballs for size 3 and 4	2 or	AB	'20' × 6 (=120) **and** '20' × 2 (=40)
	Accurate figures	3	ABC	120 (size 3) **AND** 40 (size 4) **AND** 20 (size 5)
Q8(b)	Begins to work with proportion or uses single packet only with decision and accurate figure	1 or	D	$23 ÷ 5$ (= 4.6) **OR** $4 × 5$ (=20) oe **OR** 4 boxes stated **OR** e.g. states 2 boxes and 13 packs **or** 3 boxes and 8 packs **OR** No **AND** $23 × 4.49$ = (£)103.27
	Full process to find figures to compare using multiple boxes or uses a single box with 18 packets with decision and accurate figure	2 or	DE	e.g. $4 × 20.25 + 3 × 4.49$ (=94.47) **OR** $(100 – 4 × 20.25) ÷ (23 – 4 × 5)$ (=6.3..) **OR** No **AND** $20.25 + 18 × 4.49$ = (£)101.07
	Valid decision with accurate figures	3	DEF	e.g. Yes **AND** (£)94.47 **or** (£)96.67 **or** (£)98.87 **OR** Yes **AND** (£) 6(.3..) from full working
Total marks for question		6		

Question	Process	Mark	Mark Grid	Evidence
Q9(a)	Begins to work with angles	1 or	A	180 – (63 + 58) (=59) **and** 180 – '59' (=121) **OR** 63 + 58 (=121)
	Accurate figure	2	AB	121
Q9(b)	Checks answer by estimation	1	C	e.g. 180 – 60 – 60 (=60) **and** 180 – 60 = 120 **OR** 60 + 60 = 120
Total marks for question		**3**		

Question	Process	Mark	Mark Grid	Evidence
Q10	Begins process to work with speed or time	1 or	A	e.g. 18 ÷ 24 (=0.75) **OR** 36 miles in 48 minutes **OR** 24 ÷ 60 (=0.4) **OR** 50 ÷ 60 (=0.833…) **OR** 18 ÷ 50 (=0.36) **OR**
	Full process to find figures to compare	2 or	AB	e.g. '0.75' × 60 (=45) **OR** 18 ÷ '0.4' (=45) **OR** 18 ÷ 50 (=0.36) and 24 ÷ 60 (=0.4) **OR** 18 ÷ '0.8333' (=21.6) **OR** 50 × '0.4' (=20)
	Valid decision with accurate figure	3	ABC	e.g. Yes **AND** 45 **OR** Yes **AND** 0.36 **and** 0.4 **OR** Yes **AND** 21.6 (compared with 24) **OR** Yes **AND** 20
Total marks for question		**3**		

Question	Process	Mark	Mark Grid	Evidence
Q11	Process to find circumference	1	A	$\pi \times 25$ (=78.5398) allow 78.5 to 78.55 to imply this mark
	Begins to work with length	1 or	B	e.g. 12×9 (=108) **OR** $8 \times$ '78.5' (=628) **OR** 9×8 (=72) **OR** 500×3 (=1500)
	Develops solutions	2 or	BC	e.g. '78.5' + '108' (=186.5) **OR** '108' $\times 8$ (=864) **OR** $8 \times$ '78.5' (=628) **and** 12×9 (=108) **OR** $8 \times$ '78.5' (=628) **and** 9×8 (=72) **OR** 500×3 (=1500) **and** $8 \times$ '78.5' (=628)
	Full process to find figures to compare	3 or	BCD	e.g. '186.5' $\times 8$ (=1492) **and** 500×3 (=1500) **OR** '1500' ÷ 8 (=187.5) **and** '78.5' + (12 × 9) (=186.5) **OR** '628' + '864' (=1492) **and** 500×3 (=1500) **OR** '1492' ÷ 500 (=2.98) **OR** '1500' ÷ '186.5' (=8.04..)
	Valid decision with accurate figures	4	BCDE	e.g. Yes **AND** 1492 (mm) **and** 1500 (mm) **OR** Yes **AND** 187.5 (mm) **and** 186.5 (mm) **OR** Yes **AND** 2.98 (rolls) Yes **AND** 8(.04..) NB allow use of pi in the range 3.14 to 3.142 for accurate figures
Total marks for question		**5**		

Question	Process	Mark	Mark Grid	Evidence
Q12	Estimates amount garage pays	1	A	Estimate in range $7500 < x < 8500$
	Begins to calculate % increase	1 or	B	e.g. $34 \div 100 \times$ '[7500, 8500]' (=2550, 2890) **OR** $(100 + 34) \div 100$ (=1.34) **OR**
	Full process to find price after percentage increase	2 or	BC	e.g. '[7500, 8500]' + '[2550, 2890]' = [10050, 11390] oe
	Accurate figures (selling price)	3	BCD	[10050, 11390]
	Process to find one installment	1 or	E	{selling price} $\div 24$ [=418.75, 474.58.]
	Accurate figure ft their BCD selling price	2	EF	[418.75, 474.58]
				NB Figures within the range that come from inaccurate working do not receive the accuracy mark
Total marks for question		**6**		