Pearson Edexcel

Functional Skills

Mathematics Level 2

Paper Based OnDemand Set 9

Mark Scheme

ALWAYS LEARNING

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- If working **is crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

- **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 an appropriate range for the data used, and use consistent intervals. The scale used does not have to start at 0 and not all intervals must be labelled. The minimum requirements for labels will be given, but examiners should give credit if a title is given which makes the label obvious.

Section A (Non-Calculator)

PMAT2/N09				
Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q1	Use of rounded figure(s)	1	A	e.g. use of 50 **or** 130 **or** 1.3 May be seen in subsequent calculations
	Full process to find figures to compare	1 or	B	e.g. '50' × '130' (=6500) **OR** 70 ÷ '50' (=1.4) **OR** 70 ÷ '1.3' (=53.84..) Condone 126.7 × 48 (=6081.6) for this mark only
	Accurate figure from their estimation(s) supported	2	BC	e.g. Yes **AND** (£)65 **OR** Yes **AND** (£)1.4(0) (per litre) **OR** Yes **AND** 53(.84..) (litres) NB this question requires working shown
	Total marks for question	**3**		

Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q2	Process to find number of visitor parking spaces	1 or	A	900 – 150 (=750)
	Full process to find percentage of amount	2 or	AB	'750' ÷ 100 × 6 (=45) oe
	Accurate figure	3	ABC	45
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q3(a)	Begins process to find median by ordering decimals	1 or	A	12.096, 12.1, 12.45, 12.62, 12.738, 12.9, 12.96
	Accurate figure	2	AB	12.62
Q3(b)	Begins process to calculate, must have at least 1 fraction converted correctly	1 or	C	e.g. $\frac{35}{40} - \frac{24}{40} \left(= \frac{11}{40}\right)$
	Accurate fraction	2	CD	$\frac{11}{40}$ oe NB this question requires working shown
Total marks for question		**4**		

Question	Process	Mark	Mark Grid	Evidence
Q4	Begins process to interpret scale diagram	1 or	A	e.g. '16' × 50 (=800) **or** '10' × 50 (=500) **OR** 50 ÷ 100 (=0.5) **OR** 16(cm) **and** 10(cm)
	Full process to engage with scale	2	AB	e.g. '16' × 50 ÷ 100 (=8) **or** '10' × 50 ÷ 100 (=5) **OR** '16' × '0.5' (=8) **or** '10' × '0.5' (=5)
	Identifies mode cost per m^2	1	C	1300 identified May be seen in subsequent calculations
	Process to find area or finds cost of two-storey extension	1 or	D	e.g. '8' × '5' (=40) **OR** {mode} × 1.5 (=1950)
	Full process to find total cost of two-storey extension ft their area	2 or	DE	e.g. {area} × {mode} × 1.5 (=78000)
	Accurate figure	3	DEF	78000 NB this question requires working shown
	Total marks for question	**6**		

Section B (Calculator)

PMAT2/C09				
Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q1	Begins to work with compound measures	1 or	A	e.g. 9100 ÷ 65 (=140) **OR** 65 × 7 (=455)
	Full process to find number of days required	2 or	AB	e.g. '140' ÷ 7 (=20) **OR** 9100 ÷ '455' (=20)
	Accurate figure	3	ABC	20
	Total marks for question	**3**		

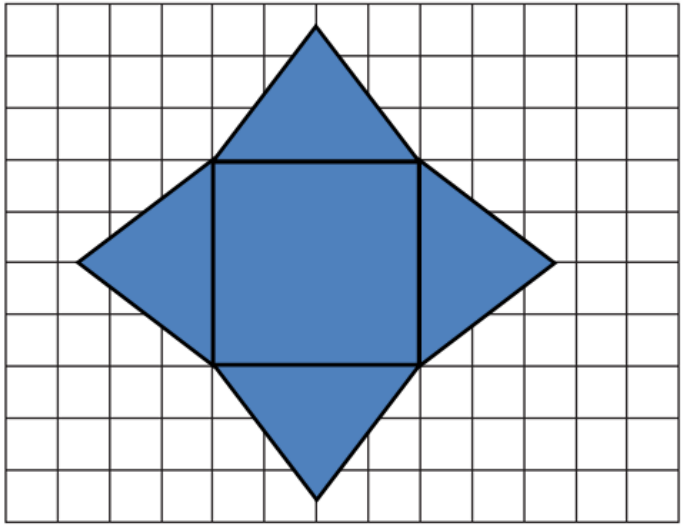
Question	**Process**	**Mark**	**Mark Grid**	**Evidence**
Q2	Begins process to work with inverse proportion	1 or	A	e.g. 3.5 × 6 (=21) **OR** 6 ÷ 4 (=1.5) **OR** 4 ÷ 6 (=0.66..) **OR** 3.5 ÷ 4 (=0.875)
	Full process to work with inverse proportion	2 or	AB	e.g. '21' ÷ 4 (=5.25) **OR** 3.5 × '1.5' (=5.25) **OR** 3.5 ÷ '0.66..' (=5.25) **OR** '0.875' × 6 (=5.25)
	Accurate figure	3	ABC	e.g. 5.25 (hrs) **or** 5 hrs 15 mins
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q3(a)	Interprets scatter diagram	1	A	identifies 24 **or** 8
	Full process to find range	1 or	B	e.g. '24' – '8' (=16) **OR** '8' to '24' **OR** 11 + '8' (=19) **or** '24' – 11 (=13)
	Valid decision with accurate figure	2	BC	e.g. Yes **AND** 16 **OR** Yes **AND** 19 **and** 24 **OR** Yes **AND** 13 **and** 8
Q3(b)	Valid decision with reason	1	D	e.g. No **AND** as it gets warmer less gas units are used **OR** No **AND** there is a negative correlation
	Total marks for question	**4**		

Question	Process	Mark	Mark Grid	Evidence
Q4	Process to find total amount recycled	1 or	A	e.g. 224.56 + 101.81 + 37 + 138.9 + 16.54 + 82.45 (=601.26)
	Full process to express as a percentage	2 or	AB	$\frac{'601.26'}{653.64} \times 100$ (=91.9..) oe
	Accurate figure	3	ABC	92
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q5	Process to find missing diameter	1	A	e.g. '1400' – 75 – 75 (=1250) **or** 14 – '0.75' – '0.75' (=12.5)
	Process to find circumference	1	B	e.g. 3.14 × {diameter} (=3925) **or** 3.14 × {diameter} (=39.25)
	Begins process to work with number of plants	1 or	C	e.g. '3925' ÷ 25 (=157) **OR** 16 × 25 (=400)
	Full process to find number of trays needed	2 or	CD	e.g. '157' ÷ 16 (=9.8125) **OR** '3925' ÷ '400' (=9.8125)
	Accurate rounded figure	3	CDE	10 NB use of π button leads to 3926.9.., 157.07..
	Total marks for question	**5**		

Question	Process	Mark	Mark Grid	Evidence
Q6	Begins process to work with speed	1 or	A	e.g. 26.2 ÷ 8 (=3.275) **OR** 26.2 ÷ (3 × 60 + 14) (=0.135..) **OR** 3 + (14 ÷ 60) (=3.233..)
	Full process to find figures to compare	2 or	AB	e.g. '3.275' × 60 (=196.5) **or** '0.275' × 60 (=16.5) **OR** 26.2 ÷ 8 (=3.275) **and** 3 + (14 ÷ 60) (=3.233..) **OR** '0.135..' × 60 (=8.10..) **OR** 26.2 ÷ '3.233..' (=8.10..)
	Valid decision with accurate figure	3	ABC	e.g. Yes **AND** 3hrs 16(.5) mins **OR** Yes **AND** 3.275 (hours) **and** 3.233.. (hours) **OR** Yes **AND** 8.1(0..) (mph) **OR** Yes **AND** 196(.5) (mins) **and** 194 (mins)
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q7(a)	Begins to draw a net	1 or	A	4 cm by 4 cm square **or** triangle with base of 4 cm and vertical height of 2.5 cm **OR** Fully correct net of a pyramid of any size side lengths
	Develops solution	2 or	AB	4 cm by 4 cm square drawn with 2 or 3 connecting correctly sized triangles on outside of square **OR** 5 faces of correct size drawn that don't fold into a correct net **OR** Fully correct net of a square based pyramid with only one dimension incorrect
	Accurate net drawn	3	ABC	Fully correct net 
Q7(b)	Accurate drawing	1	D	Circle drawn
	Total marks for question	**4**		

Question	Process	Mark	Mark Grid	Evidence
Q8(a)	Begins to use conversion graph to convert between kg and lb	1 or	A	e.g. 35 (lb) = 16 (kg) **or** 20 (lb) = 9 (kg) **or** 15 (lb) = 7 (kg) **or** 22 (lb) = 10 (kg) **or** 40 (lb) = 18 (kg) May be seen in subsequent calculations or indicated on graph
	Full process to use conversion graph to convert between kg and lb	2	AB	e.g. '16' × 100 (=1600) **or** ('9' + '7') × 100 (= 1600) **OR** '875' ÷ '40' × '18' (=393.75) **OR** '437.5' ÷ '22' × '10' (=198.86..)
	Begins to work with ratio	1 or	C	e.g. '1600' ÷ (1 + 2 + 5) (=200) **OR** 3500 ÷ (1 + 2 + 5) (=437.5)
	Full process to work with ratio for sand or gravel	2 or	CD	e.g. '200' × 2 (=400) **or** '200' × 5 (=1000) **OR** '437.5' × 2 (=875) **or** '437.5' × 5 (=2187.5)
	Accurate figures from using a correct conversion	3	CDE	e.g. 200 (cement) **and** 400 (sand) **and** 1000 (gravel) **OR** 196(.875) **and** 393(.75) **and** 984(.375) NB this question requires working shown
Q8(b)	Valid check of a ratio	1	F	e.g. 200 + 400 + 1000 = 1600 **or** 1000 ÷ 5 = 200
	Total marks for question	**6**		

Question	Process	Mark	Mark Grid	Evidence
Q9(a)	Accurate coordinates	1	A	$(-5, -4)$
Q9(b)	Plots point to create trapezium with 2 right angles and any side length	1 or	B	e.g. point plotted on line $x = 2$ **OR** point plotted on line $y = 1$
	Accurate point plotted	2	BC	$(2, 5)$ **OR** $(4, 1)$
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q10	Begins to work with formula	1 or	A	e.g. 4×4 (=16) **OR** 3.14×12.8 (=40.192) **or** $\frac{1}{3} \times 3.14$ (=1.046..) **or** $12.8 \div 3$ (=4.26..) **OR** Full substitution with or without evaluation e.g. $\frac{1}{3}(3.14)(4^2)(12.8)$
	Full process to work with formula	2 or	AB	e.g. shows full substitution **and** correct operators with or without evaluation e.g. $\frac{1}{3} \times \pi \times 4^2 \times 12.8$ **or** $\frac{1}{3} \times 3.14 \times 4^2 \times 12.8$ **or** $(3.14 \times 4^2 \times 12.8) \div 3$ (=214.35..)
	Accurate figure with units ft functional rounding or truncation	3	ABC	e.g. 214(.35..) cm^3 NB accept use of π instead of 3.14 throughout
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q11	Begins process to work with costs or selling price	1 or	A	e.g. 3 × 127 (=381) **or** 12 × 32 (=384) **OR** 7 × 12.5 (=87.5) **or** 10.5 × 6.9 (72.45)
	Full process to find total costs or total sales	2	AB	e.g. '381' + '384' (=765) **OR** '87.5' + '72.45' + 82.5 (=242.45)
	Process to find profit or begins to work with percentage	1 or	C	e.g. {sales} − {costs} (=522.55) **OR** '765' ÷ '242.45' × 100 (=315.52..) NB {sales} **or** {costs} requires AB awarded
	Full process to find percentage change	2 or	CD	e.g. $\frac{\text{'765'} - \text{'242.45'}}{\text{'242.45'}} \times 100$ (=215.52..) **OR** '315.52..' − 100 (=215.52..)
	Accurate figure rounded to 1dp	3	CDE	215.5
	Total marks for question	**5**		

Question	Process	Mark	Mark Grid	Evidence
Q12(a)	Begins process to work with an estimate of the mean	1 or	A	e.g. 2 of 8×6 **or** 23×18 **or** 38×25 **or** 53×11 Allow use of 'midpoints' provided they are within an interval including the end points **OR** 2 of 48 **or** 414 **or** 950 **or** 583 seen **OR** 60×35 (=2100)
	Full process to find figures to compare	2 or	AB	e.g. $(8 \times 6 + 23 \times 18 + 38 \times 25 + 53 \times 11) \div (6 + 18 + 25 + 11)$ (=33.25) (condone one error) **OR** 60×35 (=2100) **and** $8 \times 6 + 23 \times 18 + 38 \times 25 + 53 \times 11$ (=1995)
	Valid decision with accurate figure(s)	3	ABC	No **AND** 33(.25) **OR** No **AND** 2100 **and** 1995
Q12(b)	Valid check using reverse calculation	1	D	e.g. $33.25 \times 60 = 1995$
Q12(c)	Process to find probability	1 or	E	$\frac{25+11}{a}$ $a >$ '25 + 11' **or** $\frac{b}{60}$ $0 < b < 60$ where a and b are integers
	Accurate figure	2	EF	0.6
	Total marks for question	**6**		