FUNCTIONAL SKILLS MATHEMATICS
MARK SCHEME – LEVEL 2

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- If working **is crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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

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- **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)

Question	Process	Mark	Mark Grid	Evidence
Q1	Begins to work with proportion	1 or	A	e.g. 36 – 24 (=12) **or** 5 ÷ 2 (=2.5) **or** 36 ÷ 24 (=1.5) **or** 24 ÷ 5 (=4.8)
	Full process to find the total amount of cement required	2 or	AB	e.g. 5 + '2.5' (=7.5) **or** '1.5' × 5 (=7.5) **or** 36 ÷ '4.8' (=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	2.718
Q2(b)	Begins to evaluate formula	1 or	B	10 × 10 (=100) **or** 3 × 10 × 10 (=300) oe
	Accurate figure	2	BC	300
	Total marks for question	**3**		

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Question	Process	Mark	Mark Grid	Evidence
Q3	Process to calculate total selling price	1	A	2 × 22 + 20 (=64)
	Begins to work with percentage or profit	1 or	B	30 ÷ 100 × 50 (=15) **OR** '64' − 50 (=14) **OR** ('64' ÷ 50) × 100 (= 128)
	Full process to find figures to compare	2 or	BC	'15' + 50 (=65) **OR** ('64' − 50) ÷ 50 × 100 (=28) **OR** '128' − 100 (=28) **OR** '64' − 50 (=14) **and** 30 ÷ 100 × 50 (=15) **OR** ('64' ÷ 50) × 100 (= 128) **and** 30 + 100 (=130)
	Valid decision with accurate figures	3	BCD	No **AND** 64 **and** 65 **OR** No **AND** 28 **OR** No **AND** 14 **and** 15 **OR** No **AND** 128 **and** 130
	Total marks for question	**4**		

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Question	Process	Mark	Mark Grid	Evidence
Q4(a)	Process to convert to metric	1	A	e.g. 1600 ÷ 2 (=800)
	Process to work out area of development	1	B	e.g. $\frac{1}{2}$ × '800' × '800' (= 320000) **or** 0.5 × 0.5 ÷ 2 (=0.125)
	Process to find area of a football pitch	1	C	100 × 50 (=5000) oe
	Full process to find figures to compare	1 or	D	e.g. 50 × '5000' (=250000) **OR** '320000' ÷ '5000' (=64)
	Valid decision with accurate figures	2	DE	Yes **AND** 320000 (m^2) **and** 250000 (m^2) Yes **AND** 64
Q4(b)	Valid check	1	F	e.g. '250 000' ÷ 50 = 5000 **and** '320 000' ÷ 800 = 400
	Total marks for question	**6**		

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Section B (Calculator)

Question	Process	Mark	Mark Grid	Evidence
Q1(a)	Reads from graph accurately	1	A	[13, 14]
Q1(b)	Full process to find the distance	1 or	B	44 − 36 (=8) **or** [9.5, 10] − 8 (=[1.5, 2])
	Correct figure with units	2	BC	8 litres **or** [1.5, 2] gallons
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q2	Begins process to work with area and percentage	1 or	A	e.g. 350 ÷ 70 (=5) **or** 350 ÷ 7 (=50)
	Full process to find area of non native woodland	2 or	AB	e.g. '5' × 100 − 350 (=150) **or** '50' × (10 − 7) (= 150)
	Accurate figure	3	ABC	150
	Total marks for question	**3**		

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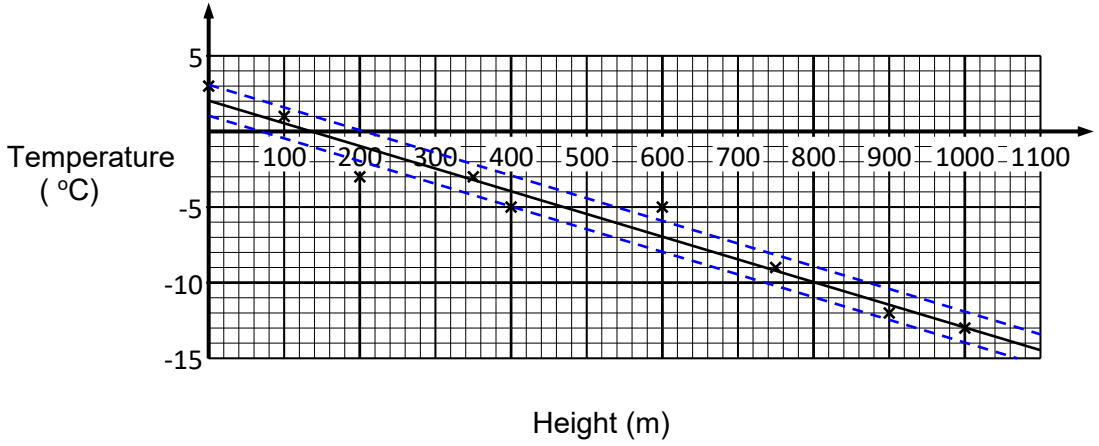
Question	Process	Mark	Mark Grid	Evidence
Q3(a)	Correct plot	1	A	Plots at (1000, −13)
Q3(b)	Draws an acceptable line of best fit	1	B	See graph below
Q3(c)	Interprets the line of best fit	1 or	C	Using line of best fit to read off temperature at 550 m **or** 950 m e.g. – 5 **or** – 11
	Valid estimate	2	CD	6 accept – 6 Ft their line of best fit provided negative gradient
Total marks for question		**4**		

Example solution for question Q3(c)



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Question	Process	Mark	Mark Grid	Evidence
Q4	Begins process to find angle	1 or	A	125 − 90 (= 35) **or** 360 − 90 − 90 − 125 (= 55)
	Complete process to find angle	2 or	AB	180 − 2 × '35' (=110) **or** 2 × '55' (=110)
	Accurate figure	3	ABC	110 N.B. look for correct angles on the diagram
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q5	Process to find volume of concrete	1 or	A	'0.12' × 2 × 3.5 (= 0.84)
	Process to find mass of concrete	2	AB	'0.84' × 2300 (=1932)
	Process to find mass of metal	1	C	5 × (3.5 + 3.5) = 35
	Full process to find total mass	1 or	D	'1932' + '35' (=1967)
	Accurate figure	2	DE	1967
	Total marks for question	**5**		

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Question	Process	Mark	Mark Grid	Evidence
Q6(a)	Begins to work with probability	1 or	A	$\frac{a}{100}$ where $0 < a < 100$ **or** $\frac{29}{b}$ where $b > 29$
	Accurate figure in acceptable probability notation	2	AB	$\frac{29}{100}$ oe
Q6(b)	Accurate figure in acceptable probability notation	1	C	$\frac{43}{72}$ oe
	Total marks for question	**3**		

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Question	Process	Mark	Mark Grid	Evidence
Q7	Begins process to find a relevant total	1 or	A	8 + 9 + 12 + 13 + 13 (=55) **or** 2 + 1 + 1 + 2 + 1 + 1 +1 + 3 + 1 + 2 + 1 + 1 + 1 + 2 + 2 (=22) **or** 12 + 13 + 19 +16 + 17 (=77)
	Complete process to find 2 relevant totals	2 or	AB	e.g. 2 + 1 + 1 + 2 + 1 + 1 + 1 + 3 + 1 + 2 + 1 + 1 + 1 + 2 + 2 (=22) **and** 12 + 13 + 19 +16 + 17 (=77)
	Full process to find a figure to compare	3 or	ABC	$\frac{'22'}{'77'}$ **or** $1 - \frac{'55'}{'77'}$ $(=\frac{22}{77})$ **OR** accept '22' ÷ '77' (=0.287…)
	Valid decision with accurate figures interpreted	4	ABCD	e.g. Yes **AND** $\frac{22}{77}$ is the same as $\frac{2}{7}$ **OR** Yes **AND** 22 ÷ 77 =0.287 **and** 2 ÷ 7 = 0.287
	Total marks for question	**4**		

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Question	Process	Mark	Mark Grid	Evidence
Q8	Process to find the area of two different rectangles	1 or	A	2 of: 1.1 × 0.8 (=0.88) 0.8 × 0.6 (=0.48) 1.1 × 0.6 (=0.66)
	Full process to find the area to be painted of 1 tank	2	AB	e.g. 1.1 × 0.8 + 2 × 0.8 × 0.6 + 2 × 1.1 × 0.6 (=3.16)
	Full process to find total area of all tanks to be painted or the exact number of tins of paint for 1 tank	1 or	C	'3.16' × 30 (=94.8(0)) **OR** '3.16' ÷ 12 (=0.263..)
	Full process to find number of tins of paint	2 or	CD	'94.8(0)' ÷ 12 (=7.9) **OR** ‘0.263’ × 30 (=7.9) accept 8 if seen from correct process
	Full process to find the cost of the tins of paint	3 or	CDE	'8' × 26.99 (=215.92)
	Accurate figure	4	CDEF	215.92
	Total marks for question	**6**		

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Question	Process	Mark	Mark Grid	Evidence
Q9(a)	Full process to find number of days	1 or	A	e.g. 30 × 3 (=90)
	Accurate figure	2	AB	90
Q9(b)	Valid check	1	C	e.g 90 ÷ 3
	Total marks for question	**3**		

Question	Process	Mark	Mark Grid	Evidence
Q10(a)	Process to begin to find median	1 or	A	1 1 2 2 2 2 3 3 3 4 4 5 5 6 9 **or** (15 + 1) ÷ 2 (=8) **or** 15 ÷ 2 (=7.5)
	Accurate figure	2	AB	3
Q10(b)	Valid decision with explanation	1	C	e.g. No the mode is 2 Yes the mean is 3.5 Yes/No takes no account of the number of days when there were no late trains
	Total marks for question	**3**		

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Question	Process	Mark	Mark Grid	Evidence
Q11	Correct numerical expression for the area of circle	1 or	A	e.g. $\pi \times 4.5^2$ **or** 3.14×4.5^2
	Accurate figures for area of the circle	2	AB	[63.585, 63.6255]
	Develops solution	1 or	C	e.g. {area} × 40 (=[2543.4, 2545.02]) area must come from a calculations involving pi and 4.5
	Full process to find number of red flowers	2 or	CD	'2543.4' × 4 ÷ 5 (=[2034, 2036])
	Accurate figure	3	CDE	2034 **or** 2035 **or** 2036
	Total marks for question	**5**		

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Question	Process	Mark	Mark Grid	Evidence
Q12	Process to find total wages before rise	1 or	A	320 × 10 + 370 × 13 + 420 × 8 + 470 × 7 + 520 × 2 (= 3200 + 4810 + 3360 + 3290 + 1040) (= 15700)
	Process to find current mean or begins to work with percentage	2	AB	e.g. '15700' ÷ 40 (=392.5) **OR** '15700' × 4 ÷ 100 (=628)
	Process to find percentage increase on the current mean or full process to work with percentage increase on current wages	1 or	C	'392.5' × 4 ÷ 100 (=15.7) **OR** '15700' + '628' (=16328) **or** 15700 × 1.04 (= 16328)
	Full process to find percentage increase on the mean or engages with £10 with all workers	2 or	CD	'392.5' + '15.7' (=408.2) **OR** '16328' + 40 × 10 (=16768)
	Full process to find new mean	3 or	CDE	'16768' ÷ 40 (=418.2) **or** '16328' ÷ 40 + 10 (=418.2) **OR** '408.2' + 10 (=418.2)
	Valid decision with accurate figure	4	CDEF	Yes **AND** (£)418.2(0)
	Total marks for question	**6**		