Mark Scheme

Mock Paper – Set 1

Pearson Edexcel GCSE
In Mathematics (1MA1)
Higher (Calculator) Paper 3H

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## General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

**1**    All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

**2**    All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

**Questions where working is not required**: In general, the correct answer should be given full marks.
**Questions that specifically require working**: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

**3**    **Crossed out work**
This should be marked **unless** the candidate has replaced it with an alternative response.

**4**    **Choice of method**
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

**5**    **Incorrect method**
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

**6** **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

**7** **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

**8** **Probability**

Probability answers must be given as a fraction, percentage or decimal.  If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

**9** **Linear equations**

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere).  Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

**10** **Range of answers**

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and all numbers within the range.

| **Guidance on the use of abbreviations within this mark scheme** |
| :--- |

| **M** | method mark awarded for a correct method or partial method |
| :--- | :--- |
| **P** | process mark awarded for a correct process as part of a problem solving question |
| **A** | accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details) |
| **C** | communication mark |
| **B** | unconditional accuracy mark (no method needed) |
| | |
| **oe** | or equivalent |
| **cao** | correct answer only |
| **ft** | follow through (when appropriate as per mark scheme) |
| **sc** | special case |
| **dep** | dependent (on a previous mark) |
| **indep** | independent |
| **awrt** | answer which rounds to |
| **isw** | ignore subsequent working |

# Mark scheme GCSE (9 – 1) Mathematics

| Mock Paper 1MA1: 3H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 1 | | 9 30 am | 3 | P1 lists multiples of 24 and 20 with at least 3 numbers in each list or expansion of 24 and 20 into factors<br><br>A1 identifies 120 (mins) or 2 (hours) as LCM<br><br>A1 for 9 30 am oe |
| 2 | | No with explanation | 2 | C1 for expansion of $(x + 5)^2$ with at least 3 terms correct<br><br>or substitution of the same number into both expressions<br><br>C1 No with $(x + 5)^2 = x^2 + 10x + 25$<br><br>or No with correct evaluation of both expressions |
| 3 | | 36.4 | 4 | P1 a strategy to start to solve the problem<br><br>e.g. $105 \div (5 - 2) (= 35)$<br><br>P1 process to find Laura's share<br><br>e.g. $385 - 2 \times "35" - 5 \times "35" (= 140)$<br><br>or $385 \div "35" - 2 - 5 (= 4)$<br><br>P1 process to find the percentage Laura gets<br><br>e.g. $"140" \div 385 \times 100$ oe or $"4" \div 11 \times 100$ oe<br><br>A1 answer in range 36.3 to 36.4, accept 36% |

| Mock Paper 1MA1: 3H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 4 | | | mistakes identified | 2 | C1 points joined with curve, not line segments <br> C1 points not plotted at mid-points |
| 5 | | | 46 | 2 | M1 links 5% with 2.30 or 100 ÷ 5 (= 20) <br> A1 cao |
| 6 | | | 36 | 3 | P1 a correct process to find either an interior or an exterior angle, e.g. $(180 \times 3) \div 5 (= 108)$ or $360 \div 5 (= 72)$ <br> P1 (dep) a complete process to find angle *CFD* <br> A1 cao |
| 7 | (a) | | 34.93 | 5 | P1 process to find area of circle or semicircle $\pi \times 4.2^2 (\div 2)$ <br> P1 process to find area of garden (= 74.7...) <br> P1 process to find number of boxes "74.7" ÷ 12 <br> P1 process to find cost "7" × 4.99 <br> A1 cao |
| | (b) | | Correct statement | 1 | C1 e.g. She might need to buy fewer boxes |

| Mock Paper 1MA1: 3H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 8 | (a) | | | 2 | B1 places probs for round, e.g. 4/7 and 3/7 |
| | | | | | B1 places probs for square, e.g. 3/8, 5/8, 3/8, 5/8 |
| | (b) | | $\dfrac{15}{56}$ | 2 | M1 ft for "3/7" × "5/8" |
| | | | | | A1 15/56 oe |
| 9 | (i) | | D | 1 | B1 cao |
| | (ii) | | A | 1 | B1 cao |
| 10 | | | $12m^5r^7$ | 2 | M1 2 of 3 parts correct in a product |
| | | | | | A1 cao |

| Mock Paper 1MA1: 3H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 11 | (a) | | 8 | 1 | B1 |
| | (b) | | box plot drawn | 3 | C1 at least 2 correctly plotted values including box or whiskers/tails or 5 correct values and no whiskers/tails |
| | | | | | C1 at least 2 correctly plotted values including box and whiskers/tails |
| | | | | | C1 fully correct box plot |
| | | | | | (min = 153, LQ = 164, median = 170, UQ = 175, max = 186) |
| | (c) | | comparisons | 2 | C1 a correct comparison of medians |
| | | | | | C1 a correct comparison of a measure of spread |
| | | | | | For the award of both marks at least one of the comparisons must be interpretative |
| 12 | | | No supported by correct values | 4 | P1 process to find volume of wood, e.g. $3 \times 20 \times 120$ (= 7200) |
| | | | | | P1 process to find a density, e.g. $8000 \div$ "7200" or $1030 \div 1000$ |
| | | | | | P1 complete process to find two densities for comparison |
| | | | | | P1 No with a comparison of the correct densities, 1.03 and 1.11... or 1030 and 1111 |

| Mock Paper 1MA1: 3H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 13 (a) | $f(x) = x^3 + 5x - 4$ | shown | 2 | M1 method to establish at least one root in $0 < x < 1$, e.g. $f(0) = -4$ and $f(1) = 2$ <br> C1 as there is a sign change there must be at least one root in $0 < x < 1$ (as f is continuous) |
| (b) | $x^3 + 5x - 4 = 0$ <br> $x^3 + 5x = 4$ <br> $x(x^2 + 5) = 4$ | shown | 2 | C1 at least one correct step in rearrangement <br> C1 fully correct chain of reasoning |
| (c) | | 0.709(21985) <br> or $\dfrac{100}{141}$ | 3 | B1 $x_1 = 0.8$ oe <br> M1 $x_2 = \dfrac{4}{(0.8)^2 + 5}$ oe <br> A1 0.709(21985) or $\dfrac{100}{141}$ oe |
| 14 | | 8.3 | 3 | M1 $0.5 = r^8$ or $0.5 = (1 - \dfrac{x}{100})^8$ <br> M1 $\sqrt[8]{0.5}$ can be implied by 0.917(…) seen <br> A1 $8.29 - 8.3$ |

| Mock Paper 1MA1: 3H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 15 | | 102.4 | 2 | M1 uses $(10 \div 8)^2$ oe or $(8 \div 10)^2$ oe<br><br>A1 cao |
| 16 | | 1.08 and explanation | 5 | B1 finds a bound of $a$: 6.425 or 6.435 or 6.434999...<br><br>or a bound of $b$: 5.5135 or 5.5145 or 5.5144999..<br><br>P1 uses UB and LB in equation<br><br>P1 process of choosing correct bounds,<br><br>e.g. $\sqrt{\dfrac{6.435}{5.5135}}$ or $\sqrt{\dfrac{6.425}{5.5145}}$<br><br>A1 for 1.079... and 1.080... both values must clearly come from correct working<br><br>C1 for 1.08 from 1.079... and 1.080... and "both LB and UB round to 1.08" |
| 17 | | $5x$ | 3 | P1 starts process by substituting to find volume of cylinder and volume of sphere e.g. $\pi \times (3x)^2 \times h$ and $\dfrac{4}{3}\pi \times (\dfrac{1}{2}x)^3$<br><br>P1 for forming a correct equation<br><br>A1 cao |

| Mock Paper 1MA1: 3H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 18 | | $m = \dfrac{4-5f}{f+3}$ | 4 | M1 for multiplying both sides by $5 + m$ as a first step <br><br> M1 for correctly moving their $m$ terms to one side and their other terms to the other side <br><br> M1 for factorising <br><br> A1 for $m = \dfrac{4-5f}{f+3}$ oe |
| 19 | | 38.6 | 5 | P1 process to find $CD$, e.g. $\tan 34 = \dfrac{CD}{20}$ <br><br> P1 process to find $BD$, e.g. $\cos 34 = \dfrac{20}{BD}$ or $BD^2 = 20^2 + \text{"}CD\text{"}^2$ <br><br> P1 uses sine rule to find $AD$ <br><br> e.g. $\dfrac{AD}{\sin 60} = \dfrac{\text{"}BD\text{"}}{\sin(180-60-45)}$ <br><br> P1 process to find $DAC$, e.g. $\sin DAC = \dfrac{\text{"}DC\text{"}}{\text{"}AD\text{"}}$ <br><br> A1 answer in range $38.5 - 38.6$ |

| Mock Paper 1MA1: 3H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 20 | (a) | | 18 | 1 | B1 cao |
| | (b) | | shown | 2 | C1 for first step, e.g. $(2x-3)^2 + 2$ |
| | | | | | C1 fully correct chain of reasoning that includes correct expansion of $(2x-3)^2$ |
| | (c) | | 1, 5 | 4 | P1 process to find fg($x$) and form an equation, e.g. $4x^2 - 12x + 11 = 2(x^2 + 2) - 3$ |
| | | | | | P1 process to reduce equation to $ax^2 + bx + c = 0$ |
| | | | | | P1 process to solve quadratic equation |
| | | | | | A1 cao |

| Mock Paper 1MA1: 3H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 21 | | | 4 | C1 draws *AO* and *OC* and considers angles around the point *O* (algebraic notation may be used, e.g. angles labelled *x* and *y*)<br><br>C1 uses "angle at centre..." to find angle *ABC* (e.g. $\frac{1}{2}x$) or angle *ADC* (e.g. $\frac{1}{2}y$)<br><br>C1 for $ABC + ADC = \frac{1}{2}x + \frac{1}{2}y$<br><br>C1 complete proof with all reasons given, e.g. <u>angles</u> at a <u>point</u> add up to <u>360°</u>, the <u>angle</u> at the <u>centre</u> of a circle is <u>twice the angle</u> at the <u>circumference</u><br><br>NB: do **not** accept "opposite angles of a cyclic quadrilateral add up to 180°" |