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Mark Scheme

Mock Paper – Set 1

Pearson Edexcel GCSE
In Mathematics (1MA1)
Higher (Calculator) Paper 2H

PEARSON

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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 then mark both methods **as far as they are identical** and award these 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).
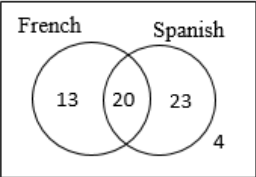
**10   Range of answers**

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: 2H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 1 | (a) |  | Correct diagram | 3 | B1 13 and 20 in correct positions<br>M1 $43 - 20 \ (= 23)$ or $60 - 43 - 13 \ (= 4)$<br>A1 correct diagram |
| | (b) | | $\dfrac{4}{60}$ | 1 | B1 $\dfrac{4}{60}$ oe or ft Venn diagram for $\dfrac{"4"}{60}$ |
| 2 | | | Rotation<br>90°<br>anti-clockwise<br>centre (0, -1) | 2 | M1 for 2 of:<br>Rotation,<br>90° anti-clockwise (or 270° clockwise)<br>(centre) (0, -1)<br>A1 correct transformation<br>No marks to be awarded if more than one transformation is given |

| Mock Paper 1MA1: 2H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 3 | (a) | | Reason | 1 | C1 reason for low attendance in hot weather, <br><br> e.g. rain, school day, measurement error |
| | (b) | | Positive | 1 | B1 positive (correlation) |
| | (c) | | 15-25 | 1 | B1 answer in range 15-25 |
| | (d) | | Data out of range | 1 | C1 explanation, e.g. extrapolation, data out of range, number of children will be negative |
| 4 | | | $13 \text{ m}^2$ | 5 | P1 process to find $FE$ $(28 - 6 - 6) \div 2 \ (= 8)$ <br> or $AB$ $(28 - 6 - 6 - 3 - 3) \div 2 \ (= 5)$ <br> P1 process to find area of a triangle <br> $\dfrac{4 \times 8}{2} \ (= 16)$ or $\dfrac{6 \times 3}{2} \ (= 9)$ or $\dfrac{5 \times 4}{2} \ (= 10)$ or $\dfrac{2 \times 3}{2} \ (= 3)$ <br> P1 complete process for shaded area <br> e.g. $8 \times 4 + 2 \times 3 - (\text{“16”} + \text{“9”})$ <br> or $\dfrac{5 \times 4}{2} + \dfrac{2 \times 3}{2}$ <br> A1 cao <br> C1 (indep) for $\text{m}^2$ |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 5 | | | $x = 3, y = -2$ | 3 | M1 correct process to eliminate one variable (condone one arithmetic error) |
| | | | | | M1 (dep) for substituting found value in one of the equations or appropriate method after starting again. |
| | | | | | A1 cao |
| 6 | (a) | <table><tr><td>$x$</td><td>0.5</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>$y$</td><td>**6**</td><td>3</td><td>1.5</td><td>**1**</td><td>0.75</td><td>**0.6**</td><td>**0.5**</td></tr></table> | Correct table | 2 | M1 2 or 3 entries correct |
| | | | | | A1 all 4 table entries correct |
| | (b) | | Graph | 2 | M1 (dep on M1) for 6 or 7 points plotted from table |
| | | | | | A1 correct graph drawn |
| 7 | (a) | UK £98, USA £94.40, Germany £102.19<br><br>UK $140.14, USA $134.99<br>Germany $146.14<br><br>UK €134.25, USA €129.31<br>Germany €139.99 | USA with reasons | 3 | P1 process to find price to compare for USA, e.g. 134.99 ÷ 1.43 (= 94.40) |
| | | | | | P1 process to find price to compare for Germany, e.g. 139.99 × 0.73 (= 102.19) |
| | | | | | A1 correct conclusion with correct figures in consistent currencies to compare e.g. (£)94.40, (£)102.19, (£)98 |
| | (b) | | Explanation | 1 | C1 reason, e.g. reference to postage costs or travel |

| Mock Paper 1MA1: 2H | | | | |
|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 8 | | | $24 : 15 : 20$ | 3 | P1 forms an equation linking 3 variables<br><br>$5a = 8b = 6c$<br><br>or gives 2 ratios with common value for $b$<br><br>e.g. $24 : 15$ and $15 : 20$<br><br>P1 unsimplified ratio<br><br>A1 cao |
| 9 | (a) | | 36000 | 1 | B1 cao |
| | (b) | | $5.96 \times 10^{-8}$ | 2 | M1 $(2.8 \div 4.7) \times 10^{-2-5}$ or $0.595\ldots \times 10^{-7}$ or $5.95\ldots \times 10^{-8}$ or 0.0000000596<br><br>A1 cao |
| 10 | (i) | | $y \propto x^2$ | 1 | B1 tick for $y \propto x^2$ |
| | (ii) | | $y = 16x^2$ | 3 | M1 for $y = kx^n$ ft<br><br>M1 for $400 \div 25$ and $576 \div 36$ or 16<br><br>A1 $y = 16x^2$ |

| Mock Paper 1MA1: 2H | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| 11 (a) | | 76.0 | 3 | P1 for $\tan x = \dfrac{h}{d}$ <br><br> P1 for $\tan^{-1} \dfrac{4d}{d}$ $(= 75.963..)$ <br><br> A1 $75.9 - 76$ |
| (b) | | Description | 1 | C1 ft e.g. decreases value of $h$ |
| 12 (a) | | $n^2 + 2n$ | 3 | M1 correct deduction from differences, <br> e.g. 2$^{\text{nd}}$ difference of 2 implies $1n^2$ or $1^2$, $2^2$, $3^2$ <br> M1 $1^2$, $2^2$, $3^2$ linked with 2, 4, 6$^{.}$ <br> A1 $n^2 + 2n$ oe |
| (b) | | Explanation | 1 | C1 explanation that 31 is not a power of 2 |

| Mock Paper 1MA1: 2H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 13 (i) | | 150 | 3 | P1 $\frac{8}{40}$ or $\frac{30}{8}$ or $\frac{8}{30}$ <br><br> P1 $\frac{8}{40} = \frac{30}{n}$ or $\frac{8}{30} = \frac{40}{n}$ or $\frac{30 \times 40}{8}$ <br><br> A1 cao |
| (ii) | | Explanation | 1 | C1 e.g. if tags fell off Alex will have over-estimated the number of ducks. |
| 14 | | 625 | 2 | M1 for $3^{4n}$ or $5^4$ or $(3^{-n})^{-4}$ or $0.2^{-4}$ <br><br> A1 625 |

| Mock Paper 1MA1: 2H | | | | |
|---|---|---|---|---|
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 15 | | 6.55 | 5 | P1 process to find area of sector *AOB* <br><br> $\frac{80}{360} \times \pi \times 30^2 \ (= 200\pi)$ <br><br> P1 process to find area of triangle *AOB* <br><br> $\frac{1}{2} \times 30^2 \times \sin 80 \ (= 443...)$ <br><br> P1 process to find segment area <br><br> $\frac{80}{360} \times \pi \times 30^2 - \frac{1}{2} \times 30^2 \times \sin 80$ <br><br> P1 process to find percentage <br><br> $(\frac{80}{360} \times \pi \times 30^2 - \frac{1}{2} \times 30^2 \times \sin 80 \ ) \div \pi \times 30^2$ <br><br> A1 answer in range 6.5-6.6 |
| 16 | | Errors identified | 2 | B2 identifies 2 errors from: <br><br> $x + y \leq 7$ rather than $x + y \leq 6$ (accept = for $\leq$) <br><br> $x \geq 0$ rather than $y \geq 0$ (accept = for $\geq$) <br><br> $y \geq x + 2$ rather than $y \leq x + 2$ <br><br> (B1 identifies one error) |

| Mock Paper 1MA1: 2H | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 17 | (a) | | 21.4 | 3 | M1 for using values 3.6 and 9.6<br><br>M1 for substituting values into trapezium rule,<br><br>e.g. $\frac{1}{2} \times 1 \times ((3.6 + 9.6) + 2(6.4 + 8.4))$<br><br>A1 cao |
| | (b) | | Distance in metres | 2 | C1 estimate of distance covered<br>C1 in metres |
| | (c) | | | 1 | C1 under-estimate as chords are under curve |
| 18 | | | 66 814 260 | 3 | M1 method for combinations for any 2 roles<br>$95 \times 94$ (= 8930) or $87 \times 86$ (7482)<br>M1 method for all combinations $95 \times 94 \times 87 \times 86$<br>A1 66 814 260 |

| Mock Paper 1MA1: 2H | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| 19 | | $y = -4x + 5$ | 5 | P1 for appropriate process to find gradient<br><br>e.g. $\frac{12-7}{11--9}$ $(=\frac{1}{4})$<br><br>P1 process to find $y$ coordinate $7 + \frac{2}{5} \times 5$ $(= 9)$<br><br>or $x$ coordinate $-9 + \frac{2}{5} \times 20$ $(=-1)$<br><br>P1 method to find gradient of line $L$ $\frac{-1}{\frac{1}{4}}$ $(=-4)$<br><br>M1 substitution of found values for $x$, $y$ and $m$ into equation for straight line<br><br>A1 $y = -4x + 5$ |
| 20 | | 45 | 4 | B1 $p = 5$<br>M1 $405 = 5q^4$<br>M1 $q = \sqrt[3]{81}$ $(=3)$<br>A1 cao |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 21 | | | 5 | M1 $\overrightarrow{BA} = \mathbf{a} - 3\mathbf{b}$ or $\overrightarrow{YA} = \frac{1}{2}(\mathbf{a} - 3\mathbf{b})$ <br><br> M1 $\overrightarrow{XY} = \mathbf{b} + \frac{1}{2}(\mathbf{a} - 3\mathbf{b})$ or $\overrightarrow{YZ} = \mathbf{a} + \frac{1}{2}(\mathbf{a} - 3\mathbf{b})$ or <br> $\overrightarrow{XZ} = 2\mathbf{a} - 2\mathbf{b}$ <br><br> M1 two of $\overrightarrow{XY} = \mathbf{b} + \frac{1}{2}(\mathbf{a} - 3\mathbf{b})$ or $\overrightarrow{YZ} = \mathbf{a} + \frac{1}{2}(\mathbf{a} - 3\mathbf{b})$ or <br> $\overrightarrow{XZ} = 2\mathbf{a} - 2\mathbf{b}$ <br> M1 simplification to enable comparison of 2 of <br> $\overrightarrow{XY}$, $\overrightarrow{XZ}$ and $\overrightarrow{YZ}$ <br><br> e.g. 2 of $\frac{1}{2}(\mathbf{a} - \mathbf{b})$, $\frac{3}{2}(\mathbf{a} - \mathbf{b})$ and $2(\mathbf{a} - \mathbf{b})$ <br><br> C1 completes proof with reference to 2 of $\overrightarrow{XY}$, $\overrightarrow{XZ}$ and $\overrightarrow{YZ}$ parallel and a common point |