Comparison of key skills specifications 2000/2002 with 2004 standardsX015461July 2004Issue 1

Mark Scheme

Mock Set 5

Pearson Edexcel GCSE (9 – 1)

In Mathematics (1MA1)

Higher (Non-Calculator) Paper 1H

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Paper 1H Mock Set 5 Mark Scheme v1.0

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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 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.

**11 Number in brackets after a calculation**

Where there is a number in brackets after a calculation E.g. 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

**12 Use of inverted commas**

Some numbers in the mark scheme will appear inside inverted commas E.g. “12” × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

**13 Word in square brackets**

Where a word is used in square brackets E.g. [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

**14 Misread**

If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

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| **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 awarded for a fully correct statement(s)  with no contradiction or ambiguity **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 |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 1 |  | 5*m* + 6 | M1 | for 2*m* – 6 **or** 3*m* + 12 |  |
|  |  |  | A1 | cao |  |
| 2 | (a) | Description | C1 | for description of relationship, eg the greater the age the less the value (price, cost etc) oe, accept negative correlation | Do NOT accept “negative”, “negative relationship” or “negative proportion” |
|  | (b) | Line of best fit | C1 | for a single straight line that could be used to take readings |  |
|  | (c) | Explanation | C1 | for explanation, eg the LOBF would have to be used outside the data |  |
| 3 |  | 60 | P1 | for process to find number studying French, eg 270 ÷ 9 × 2 (= 60) |  |
|  |  |  | P1 | for process to find number studying Spanish, eg “60” ÷ 3 × 7 (= 140) |  |
|  |  |  | P1 | (dep P1) for process to find number studying German,eg 270 – [number studying French] – [number studying Spanish] (= 70) | [number studying French] and [number studying Spanish] must be clearly identified eg from working |
|  |  |  | P1 | for process to find a percentage, eg 42 ÷ “70” × 100 oe |  |
|  |  |  | A1 | cao |  |
| 4 | (a) |  | B2 | cao | Any orientation |
|  |  |  | (B1 | for a 4 by 4 square) |  |
|  | (b) |  | M1 | for attempt at a 3D sketch with a pentagonal face | Hidden edges may or may not be shown |
|  |  |  | A1 | for a correct 3D sketch | Do not accept a sketch which shows additional flaps |
| 5 |  | 25 | P1 | for substituting, eg 3 = $\frac{1500}{A}$ **or** (*A* =) 1500 ÷ 3 (=500) |  |
|  |  |  | P1 | (dep P1) for [area of base] ÷ 20 | [area of base] must be clearly stated or come from an attempt at using the formula if 500 is not being used |
|  |  |  | A1 | cao |
| 6 | (a) | 2.47 × 105 | B1 | cao |  |
|  | (b) | 0.00065 | B1 | cao |  |
|  | (c) | 2.4 × 10 –12  | M1 | for 3 × 8 (= 24) **and** 10 (-7 + - 6) (=10 -13)**OR** for 0.0000000000024 oe eg 0.24 × 10 -11 **or** 24 × 10 -13 **OR** for an answer of 2.4 × 10 *n* where *n* ≠ –12 |  |
|  |  |  | A1 | cao |   |
| 7 |  | 4.5 | P1 | for process to find area of square, eg (24 ÷ 4) 2 (=36) | Award for 62 or 36 seen |
|  |  |  | P1 | for start of process to find area of trapezium, eg $\frac{1}{2}$ (*x* + 3*x*) × 8 **or** $\frac{1}{2}$ (*AB* + 3*AB*) × 8 **or** *x* × 8 + $\frac{1}{2}$ × 2*x* × 8 |  |
|  |  |  | P1 | for using a suitable equation, eg $\frac{1}{2}$ (*x* + 3*x*) × 8 = 2 × “36”  |  |
|  |  |  | A1 | cao | Accept $\frac{72}{16}$ oe |
| 8 |  | 90 | M1 | for using a rounded value, eg 602 ÷ $\sqrt{1600}$**or** 602 = 3600 **or** $\sqrt{1600}$ = 40 |  |
|  |  |  | A1 | for 90 |  |
|  |  |  | C1 | overestimate and reason, eg 58.7 rounded up and 1612 rounded down |  |
| 9 |  | 25 | P1 | for process to find link between start and end of 1st or 2nd year, eg two values in the ratio 1 : 0.8 such as 100 and 80 **or** two values in the ratio 1 : 0.6 such as 100 and 60 **OR** for 0.8 **or** 0.6**OR** uses own figures eg 40% of 1000 (= £400), 20% of 1000 (= £200) |  |
|  |  |  | P1 | for process to find link between end of 1st year and end of 2nd year, eg two values in the ratio 0.8 : 0.6 such as 80 and 60**OR** for 0.6 ÷ 0.8 (= 0.75) **OR** uses own figures eg 200 ÷ 800 × 100 |  |
|  |  |  | A1 | cao |  |
| 10 | (a) | Box plot | M1 | for correctly identifying one of the LQ (32), median (38), or UQ (47) | Might be indicated in the set of data values |
|  |  |  | M1 | for showing a box and at least 3 correctly plotted values  | Values: 22, 32, 38, 47, 58 |
|  |  |  | A1 | for a fully correct box plot |  |
|  | (b) | Comparisons | C1 | ft for correct comparison of the medians | Figures need not be stated but if they are they must be correct (ft)Context can include reference to age or years |
|  |  |  | C1 | ft for correct comparison of ranges or IQRsNB for award of both marks at least one comparison must be in context |
| 11 |  | 12 and 30 | P1 | for start of process, eg forms two equations 3*x* + *y* = 66 and *x* + 2*y* = 72 |  |
|  |  |  | M1 | for a 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 (condone one arithmetic error) |  |
|  |  |  | A1 | for small = 12 and large = 30 |  |
| 12 |  | –2 | M1 | for expanding, eg $\sqrt{7} × \sqrt{7}+5 × \sqrt{7}-5 × \sqrt{7 }- 5 × 5$**or** $\left(\sqrt{7}\right)^{2}- 25$ **or** $\sqrt{49 }- 25 $**or** 7 – 25 **or** –18 |  |
|  |  |  | M1 | (indep) for $\left(\sqrt{7}\right)^{2}=7$ **or** $\sqrt{7 } × \sqrt{7 } = 7 $ |  |
|  |  |  | A1 | cao |  |
| 13 |  | Mistake identified | C1 | for identifying the mistake **Acceptable**The first number should be 5 (or – –5 or +5)Its –*b* so it should be – –5 (or 5 or +5)She wrote –5, not – –5 (or 5 or +5)**Not acceptable**She should have written 52, not (–5)2She didn’t work out the square root |  |
| 14 |  | $$\frac{17}{24}$$ | P1 | for a correct product, $\frac{7}{10}$ × $\frac{6}{9}$ × $\frac{3}{8}$ **or** $\frac{7}{10}$ × $\frac{6}{9}$ × $\frac{5}{8}$ **or** $\frac{7}{10}$ × $\frac{3}{9}$ |  |
|  |  |  | P1 | for a complete process, eg $\frac{3}{10}$ + $\frac{7}{10}$ × $\frac{3}{9}$ + $\frac{7}{10}$ × $\frac{6}{9}$ × $\frac{3}{8}$ **or** $1-\left(\frac{7}{10} × \frac{6}{9 } × \frac{5}{8} \right)$ |  |
|  |  |  | A1 | for $\frac{17}{24}$ oe | Accept equivalent fractions, decimals (eg 0.70… or 0.71) or percentages (eg 70.. or 71) |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 15 |  | *x*$ = \left(\pm \right)\sqrt{\frac{3 + y}{1 - 2y}}$ | M1 | for multiplying both sides by 2*x*2 + 1eg *y*(2*x*2 + 1) = *x*2 – 3 **or** 2*x*2*y* + *y* = *x*2 – 3 | Condone missing brackets for this mark only |
|  |  |   | M1 | (dep M1) for a method to isolate terms in *x* in a correct equation eg *x*2 – 2*x*2*y* = *y* + 3 **or** 2*x*2*y* – *x*2 = –*y* – 3 |  |
|  |  |  | M1 | for *x*2 $= \frac{3 + y}{1-2y}$ oe |  |
|  |  |  | A1 | A1 for *x*$ = \left(\pm \right)\sqrt{\frac{3 + y}{1 - 2y}}$ oe eg *x*$ = \left(\pm \right)\sqrt{\frac{- y - 3}{2y - 1}}$ |  |
| 16 |  | 15 : 12 : 9 : 25 | P1 | for starting the process, eg *a* **=** $\frac{5}{4}$*b* **or** *b* **=** $\frac{5}{4}$*a* **or**  *d* **=** $\frac{5}{3}$*a***OR**  *a* : *b* = 5 : 4 **or** *b* : *c* = 4 : 3 |  |
|  |  |  | P1 | for three terms equivalent to $\frac{5}{4}$(*b*), 1(*b*), $\frac{3}{4}$(*b*) **or** to 1(*a*),$\frac{4}{5}$(*a*), $\frac{5}{3}$(*a*)**OR** for *a* : *b* : *c* = 5 : 4 : 3 |  |
|  |  |  | P1 | for ratio with at least 3 of the values, including both *c* **and** *d*, correcteg $\frac{5}{4}$ : 1 : $\frac{3}{4}$ : $\frac{25}{12}$oe **or** 1 : $\frac{4}{5}$ : $\frac{3}{5}$ : $\frac{5}{3}$ oe**OR** for 5×3 : 4×3 : 3×3 (= 15 : 12 : 9) **and** 3×5 : 5×5 (= 15 : 25) |  |
|  |  |  | A1 | for 15 : 12 : 9 : 25 oe ratio with integer values |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 17 |  | 60 – *x* | M1 | for using angle at centre is twice the angle at the circumference,eg angle *BOD* = 6*x* | Reasons need not be given. |
|  |  |  | M1 | for using opposite angles of a cyclic quadrilateral, eg angle *BAD* = 180 – 3*x* |  |
|  |  |  | M1 | for a complete process, eg (360 – (180 – 3*x*) – 6*x*) ÷ 3 |  |
|  |  |  | A1 | for 60 – *x* | Do not award marks for answer if not supported by working. |
| 18 |  | 3(*x* + 2*y*)(*x* – 2*y*) | B2 | cao |  |
|  |  |  | (B1 | for 3(*x*2 – 4*y*2) **or** (3*x* + 6*y*)(*x* ‒ 2*y*) **or** (*x* + 2*y*)(3*x* ‒ 6*y*) ) |  |
| 19 |  | $$\frac{\sqrt{3}}{72}$$ | M1 | for $\frac{1}{12 ^{\frac{3}{2}}}$ **or** $\frac{1}{\left(\sqrt{12}\right)^{3}}$ | These marks can be awarded whenever this is seen (ie as independent marks), which might be later in the process |
|  |  |  | M1 | for writing $\sqrt{12}$ as $2 \sqrt{3}$ |
|  |  |  | M1 | for method to rationalise the denominator eg $\frac{1}{\left(2\sqrt{3}\right)^{3}}\frac{× \left(2\sqrt{3}\right)^{3}}{× \left(2\sqrt{3}\right)^{3}}$  |
|  |  |  | A1 | for $\frac{\sqrt{3}}{72}$ (accept *h* = 72)SC B3 for equivalent fraction in form $\frac{\sqrt{b}}{c}$ , eg $\frac{\sqrt{12}}{144}$ |   |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 20 | (a) | Graph drawn | C1 | correct graph drawn | Graph should cross through the 5 key intersection points. |
|  | (b)(i) | 0.5 | B1 | cao |  |
|  |  (ii) | 120 or 240 | B1 | for 120 **or** 240 **or** any appropriate value from 120 ± 360*n* or 240 ± 360*n,* where *n* is an integer |  |
| 21 |  | No | P1 | Process to find $→$ **or** $→$ **or** $→$ | $→ $= –2**a** + **b**$→$ = –5**a** + 3**b**$→$ = –7**a** + 4**b** |
|  |  |  (supported) | P1 | Process to find two of $→$ , $→$ , $→$ |
|  |  |  | C1 | No, with explanation based on two fully correct vectors in simplified form eg –5**a** + 3**b** is not a multiple of –2**a** + **b** so *YZ* and *XY* are not parallel |  |
| 22 | (a) | 3(*x* – 4)2 – 10 | M1 | method to find *a*, eg 3*x*2 – 24*x* + 38 = 3(*x*2 + …) **or** *a* = 3 |  |
|  |  |  | M1 | for 3((*x* – 4)2 + …)) **or** *b* = 4 |  |
|  |  |  | A1 | for 3(*x* – 4)2 – 10 **or** *a* = 3, *b* = 4, *c* = 10 |  |
|  | (b) | (4, –10) | B1 | ft from answer of form *a*(*x* *+* *b*)2 *+* *c* |  |

| **Paper: 1MA1/1H** |
| --- |
| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 23 |  | *y* = – $\frac{1}{2}$ *x* – $\frac{5}{2}$ | P1 | for *x*2 + *y*2 = 85 **or** + (–9)2 + 22 = 85  |  |
|  |  |  | P1 | for process to find *y* coordinate of *B*, eg $\sqrt{85-7^{2}}$ |  |
|  |  |  | A1 | for selecting *b* = –6 |  |
|  |  |  | P1 | for complete process to find equation of line **L**eg substitutes *x* = –9 and *y* = 2 in *y* = “– $\frac{1}{2}$ ” *x* + *c* |  |
|  |  |  | A1 | for *y* = – $\frac{1}{2}$ *x* – $\frac{5}{2}$ oe |  |

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