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)

Foundation (Calculator) Paper 3H

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Paper 3H Mock Set 5 Mark Scheme v1.0

**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.

|  |
| --- |
| **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: 1MA1/3H** |
| --- |
| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 1 |  | 1.61 | M1 | for 5.706(...) or 3.108(...) or 3.109 or 2.597(...) or 2.598 |  |
|  |  |  | A1 | for 1.61(....) |  |
| 2 | (i) | 22.5 | M1 | for a method to find scale factor, eg 5 ÷ 2 (= 2.5) or 2 ÷5 (= 0.4) oe | May see evidence on diagram or as part of calculation, 9 × 5 ÷ 2 or 9/2 |
|  |  |  | A1 | cao | Accept $22\frac{1}{2}$  |
|  | (ii) | 7.2 | M1 | for a method to find length of *BC*, eg 18 ÷ “2.5” or 18 × “0.4” or 9 × 18 ÷ “22.5” oe or $\frac{18}{5}$ | May see evidence on diagram |
|  |  |  | A1 | cao | Accept $7\frac{1}{5}$ oe |
| 3 |  | 37 800 | M1 | for finding 3 products within intervals (including end points) |

|  |  |
| --- | --- |
| Min *fx* | Max *fx* |
| 5000 | 25 000 |
| 25 000 | 45 000 |
| 45 000 | 65 000 |

 |
|  |  |  | M1 | for Ʃ“*fx*”÷ (9 + 25 + 16)**or** (15 000 × 9 + 35 000 × 25 + 55 000 × 16) $÷$ (9 + 25 + 16)**or** (“135 000” + “875 000” + “880 000”) ÷ “50”**or** “1 890 000” ÷ “50” | Ʃ“*fx*” **must** come from 3 products *fx* within intervals (including end points) |
|  |  |  | A1 | cao |  |
| 4 |  | 942 | M1 | for complete method, eg *π* × 5² × 12 | May be seen in 2 stages |
|  |  |  | A1 | for value in the range 942 to 943 |  |
| 5 |  | 3.91 | P1 | for process to find 1.8% of 4000, eg 0.018 × 4000 (= 72) oe or 1.018 × 4000 (= 4072) oe | For process marks accept figures ±1 pence which do not need to be presented in money notation (to 2dp) or with monetary symbols. |
|  |  |  | P1 | for complete process to deal with compound interesteg 4000 × $1.018^{3}$ (= 4219.91...) oe | Award marks for correct processes shown, figures can be taken as implying the process. |
|  |  |  | P1 | for complete process to deal with simple interesteg 4000 × 0.018 × 3 (= 216)  |  |
|  |  |  | A1 | for 3.91 or 3.92 |  |
| 6 |  | 183.5, 184.5 | B1 | for 183.5 in the correct position |  |
|  |  |  | B1 | for 184.5 in the correct position | Accept 184.4$\dot{9}$ or 184.499… |
| 7 |  | 40.8 | P1 | for start of process to find the width of the rectangle eg. tan 35 = $\frac{BC}{12}$ oe |  |
|  |  |  | P1 | for complete process to find width eg 12 × tan 35 (= 8.40...) oe |  |
|  |  |  | P1 | for process to find perimeter eg 2 × “8.40...”+ 2 × 12 |  |
|  |  |  | A1 | for answer in the range 40.80 to 40.81 |  |
| 8 | (a) | –25, (–6), 1, 2, (3), 10, 29 | B2 | for all values correct |  |
|  |  |  | (B1 | for 3 or 4 missing values correct) |  |
|  | (b) | Curve drawn | M1 | (dep B1) for plotting their values  |  |
|  |  |  | A1 | for correct smooth curve drawn |  |
|  | (c) | 1.6 | B1 | for value in the range 1.5 to 1.7 ft (b)  |  |
| 9 | (a) | 62 300 000 | B1 | accept in standard form, 6.23 × 107  |  |
|  | (b) | 270 | P1  | for process to find total land area, eg 1.3 × 105 +8.0 × 104 +2.1 × 104 (= 2.31 × 105 oe) |  |
|  |  |  | P1  | for complete process, eg (“6.23 × 107”) ÷ (“2.31 × 105”) |  |
|  |  |  | A1 | for value in range 269 to 270 | Accept standard form |
| 10 |  | 135 | P1 | shows process to be used, eg $\frac{20}{8}$ × 54 oe or $\frac{54}{n}$ = $\frac{8}{20}$ oe |  |
|  |  |  | A1 | cao |  |
| 11 |  | 4.8 | M1 | for correct first step, eg 8 3*x* = 4(8 2*x*) |  |
|  |  |  | M1 | (dep M1) for isolating terms in *x*, eg 8*x* ‒ 3*x* = 32 ‒ 8 or5*x* = 24 |  |
|  |  |  | A1 | for 4.8 or 4 $\frac{4}{5}$ or $\frac{24}{5}$  |  |
| 12 | (a) | 224 | B1 | cao |  |
|  | (b) | 91  | M1 | for recognising the non-replacement nature of the problem,eg $\frac{14 × 13}{2}$ or 14 × 13 or 14² – 14 or 14 × 13 × 2  |  |
|  |  |  | A1 | cao |  |

| **Paper: 1MA1/3H** |
| --- |
| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 13 | (a) | Correct statement | C1 | for substituting both 1 and 2 into *x*4 – 3*x* – 1 (= ‒3 and 9) |  |
|  |  |  | C1 | for values –3 and 9 plus explanation that these are above andbelow 0 oe (thus implying a solution lies between 1 and 2) | Explanation need not be in words eg ‒3 < 0 and 9 > 0 |
|  | (b) | Correct rearrangement | C1 | for correct algebraic rearrangement | Stage *x*4 = 3*x* + 1 = 0 must be seen |
|  | (c) | 1.414 | B1 | for 1.414(...) |  |
| 14 | (a) | Result shown | P1 | for process to use the formula for the circumference of a circle, eg 2$πr$ or 2$π (r + t)$**or** for process to use the sector angle, eg $\frac{108}{360}$ oe | Fractions may be simplified at any stage |
|  |  |  | P1 | for a complete process to find the perimeter,eg $\frac{108}{360} \left\{2πr + 2I \left(r + t\right)\right\}$ + 2*t* |  |
|  |  |  | P1 | for process to use a common denominator,eg $\frac{108 \left\{2πr + 2π \left(r + t\right)\right\} + 720t}{360}$ |  |
|  |  |  | P1 | for expansion of brackets and collection of terms, eg 432$πr$ + 216$πt$ + 720*t*  |  |
|  |  |  | C1 | for completion of processes to get the result. | Need to see steps in working, not only the final expression |
|  | (b)(i) | 6*π* + 20 | B1 | cao |  |
|  | (ii) | explanation | C1 | for explanation, eg this gives the perimeter of the sector (of circle, angle 108°, radius 10 cm) |  |
| 15 |  | *c* = $\frac{3}{d} $ | M1 | for *c* = $\frac{k}{d} $ oe, or *c* $∝$ $\frac{1}{d}$ may be implied by substitution  |  |
|  |  |  | M1 | for substitution to find *k*, eg 0.5= $\frac{k}{6}$  |  |
|  |  |  | A1 | for *c* = $\frac{3}{d} $ or *c* = 3$d ^{-1}$ |  |
| 16 |  | Result shown | M1 | for starting to work, eg with ratios B : G = 6 : 1 oe or B + G ; R + Y = 2 : 1 oe**OR**eg with fractions B = $\frac{6}{7}$ (B + G) oe or B + G = $\frac{2}{3}$ (B + G + R + Y) oe**OR**eg with numbers in the correct ratio 1G, 6B or 14 G + B, 7 R + Y | Students may work with ratios, fractions or numbers of countersAward marks for any appropriate method. |
|  |  |  | M1 | for complete method, eg using ratios B : G : R + Y = 6 : 1 : 3 $\frac{1}{2}$ oe **OR**eg using fractions B = $\frac{6}{7}$ (B + G) oe and B + G = $\frac{2}{3}$ (B + G + R + Y) oe**OR**eg using numbers of counters 2G, 12B, 7R + Y |  |
|  |  |  | M1 | for method to find the proportion of blue counters, eg from ratios $\frac{\left[6\right]}{\left[6\right] + \left[1\right] + \left[3\frac{1}{2}\right]}$ oe**OR**eg from fractions $\frac{6}{7}$ × $\frac{2}{3}$**OR**eg using numbers of counters $\frac{\left[12\right]}{\left[2\right] + \left[12\right] + \left[7\right]}$ |  |
|  |  |  | C1 | for figure rounding to 57 seen from correct working |  |
| 17 |  | 185 | P1 | for using the sine rule to find angle *QSR*, eg $\frac{26}{sin120}$ = $\frac{12}{\sin(QSR)}$**OR**for using the cosine rule to find *SR* eg 26² = 122 + *SR*2 – 2 × 12 × *SR* × cos$120$ oe | Accept values to 3 figures or more, rounded or truncated throughout. |
|  |  |  | P1 | for complete process to find expression for sin *QSR,*eg sin *QSR* = $\frac{12 × sin120}{26}$ (= 0.399....) or for *QSR* = 23.55...**OR**for process to write rule as a quadratic equation in *SR*, eg *SR*2 + 12*SR* – 532 (= 0) |  |
|  |  |  | P1 | for process to find angle *SQR*,eg 180 – 120 – “23.5...” (= 36.44...)**OR**for process to find *SR*, eg substitution into the quadratic formula, $\frac{-12 \pm \sqrt{12^{2}- 4 × 1 × -532}}{2x1}$ oe (= 17.8...) |  |
|  |  |  | P1 | for process to find area of triangle, eg $\frac{1}{2}$ × 26 × 12 × sin “36.4...” (= 92.66...)**OR**for process to find area of triangle, eg $\frac{1}{2}$ × “17.83” ×12 × sin 120 (= 92.66...) |  |
|  |  |  | A1 | for value in the range 185 to 186 | Do not award marks for answer if not supported by working. |
| 18 | (a)(i) | 1500 | B1 | cao |  |
|  | (ii) | No (supported) | C1 | for no with reason, eg five times the original is 7500 and investment is worth between 7200 and 7300 after 12 years |  |
|  | (b)(i) | 490 | M1  | for drawing a suitable tangent at *n* = 7 | Drawing a right-angled triangle is insufficient without calculation shown |
|  |  |  | M1 | for a full method to find the gradient of the tangent at *n* = 7 | Use of change in *y* over change in *x* |
|  |  |  | A1 | for answer in the range 450 to 500 from correct working or ft their tangent |  |
|  | (ii) | Interpretation | C1 | for explanation, **Acceptable examples**the rate at which the investment grows (at *n* = 7)the amount per year that the investment increasesthe investment increases at £490 per year (when *n* = 7 years)**Not acceptable examples**rate of changeincrease in the investmentinterest gained |  |
| 19 |  | Completed histogram | M1 | for method which begins to use area to find frequencyeg 6 babies = 30 squares, may be implied by one correct frequency 20, 30 or 12  | Frequencies represented on diagram are (6), 20, 30 and 12 |
|  |  |  | M1 | for method to find correct frequencies, 20, 30 and 12  |  |
|  |  |  | M1 | for method to find frequency for 3 – 3.5 kg,eg 100 – 6 – “20” – “30” – “12” (= 32) |  |
|  |  |  | C1 | for completing histogram by drawing bar of height 64  | Do not award marks for answer if not supported by working. |
| 20 |  | $$\frac{86}{110}$$ | P1 | for start of process to find probabilities for marble taken from **B**, eg P(G after G) = $\frac{9}{11}$ or P(R after G) = $\frac{2}{11}$ or P(G after R) = $\frac{8}{11}$ or P(R after R) = $\frac{3}{11}$  | May be seen marked on a tree diagram. |
|  |  |  | P1 | for $\frac{6}{10}$ × $\frac{9}{11}$ or $\frac{4}{10}$ × $\frac{8}{11}$ or $\frac{6}{10} ×\frac{2}{11}$ or $\frac{4}{10}×\frac{3}{11}$  |  |
|  |  |  | P1 | for complete process, eg $\frac{6}{10}$ × $\frac{9}{11}$ + $\frac{4}{10}$ × $\frac{8}{11}$ or 1 – $\left\{\frac{6}{10} × \frac{2}{11} + \frac{4}{10} × \frac{3}{11}\right\}$ | Either complete process scores the first 3 marks. |
|  |  |  | A1 | for $\frac{86}{110}$ oe |  |
| 21 |  | 8.5, 3.5  | M1 | for equation using volume, eg 4*xy* = 119 | Equations may not be in simplest form, eg *x* × *y* × 4 = 119 |
|  |  |  | M1 | for equation using total surface area, eg 2*xy* + 8*y* + 8*x* = 155.5 |  |
|  |  |  | M1 | for method to find equation in one variableeg *y* = $\frac{119}{4x}$ , 8*x* + 8 × $\frac{119}{4x}$ + 2 × *x* × $\frac{119}{4x}$ = 155.5**or** *x* = $\frac{119}{4y}$, 8 × $\frac{119}{4y}$ + 8*y* + 2 × $\frac{119}{4y}$ × *y* = 155.5 |  |
|  |  |  | M1 | for method to write equation in form ready to solve, eg 4*x*² – 48*x* + 119 (= 0) oe or 4*y*² – 48*y* + 119 (= 0) | Any equivalent equation in one variable with all terms on one side acceptable |
|  |  |  | A1 | for *x* = 8.5, *y* = 3.5 | Do not award marks for answer if not supported by working. |

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