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 (Calculator) Paper 2H

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Paper 2H 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.

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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: 1MA1/2H** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 1 |  | 18 | M1 | for listing factors of 90 and 126, at least 5 correct for each (with no more than 1 incorrect in each list), could be in factor pairs  **OR** for the prime factors of 90 (2, 3, 3, 5) **or** 126 (2, 3, 3, 7) | Factors of 90: 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90  Factors of 126: 1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126 |
|  |  |  | M1 | for listing factors of 90 and 126, at least 5 of each, one of which includes 18  **OR** for method to write both numbers as a product of prime factors (condone a total of one division error)  eg. two complete factor trees or 2, 3, 3, 5 and 2, 3, 3, 7 |
|  |  |  | A1 | cao |  |
| 2 | (a) | 2*a* 7 | B1 | cao |  |
|  | (b) | 4*x* 3 *y* | M1 | for any two correct of 4, *x*3 and *y* | Accept *y* 1 |
|  |  |  | A1 | cao |  |

| **Paper: 1MA1/2H** | | | | | |
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| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 3 | (a) | 2090 | P1 | for a process to convert any value in euros into pounds,  eg. 560 ÷ 1.12 (= 500) or 20.16 ÷ 1.12 (= 18) | This may be awarded later if working in euros |
|  |  |  | P1 | for a process to find total cost of apartment and car hire in euros or pounds,  eg. 560 × 3 (= 1680) + 20.16 × 15 (= 302.4)  or “500” × 3 (= 1500) + “18” × 15 (= 270) |  |
|  |  |  | P1 | for complete process to find total cost, in pounds,  eg. 320 + “1500” + “270” |  |
|  |  |  | A1 | cao |  |
|  | (b) | Cost would be less | C1 | for statement that the cost of Joe’s holiday would be less. |  |
| 4 | (a) | translation | B2 | for shape with vertices (3, – 1), (4, – 1), (4, – 2), (3, – 3) |  |
|  |  |  | (B1 | for translation by the vector where *b* ≠ – 4  or where *a* ≠ 5) |  |
|  | (b) | reflection in *y =x* | B1  B1 | for a reflection  for *y = x* | Award no marks if more than one transformation is given |

| **Paper: 1MA1/2H** | | | | | |
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| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 5 |  | Two statements | C2 | Two different statements  **Acceptable**  The polygon should not be closed / have a line at the bottom / have first and last points connected  (28, 20) has been plotted incorrectly / at (28, 32) / (The last point is at) 32 rather than 28 / last point is at the top end (of class interval)  **Not acceptable**  Points should be joined with a curve  The points haven’t (all) been plotted correctly / should be at interval ends  The points have been joined up wrong / Points should not be joined in the shape of a polygon / They’ve connected all the points  Has not started at the origin | Ignore additional statements provided there is no contradiction |
|  |  |  | (C1 | for one statement eg from those above) |  |
| 6 |  | Yes  (supported) | P1 | for process to find the width of the rectangle before or after the increases, eg. 20 ÷ 8 (= 2.5) or (20 + 4) ÷ (8 + 2) (= 2.4)  **or** for method to find % increase in area, eg. 4 ÷ 20 × 100 (= 20)  **or** for method to find % increase in length, eg. 2 ÷ 8 × 100 (= 25) |  |
|  |  |  | P1 | for process to find percentage change in width,  eg. (“2.5” – “2.4”) ÷ “2.5” × 100 (= 4)  or (= 0.96)  **or** for process to find change in width if 5% decrease,  eg. “2.5” × 0.05 (= 0.125) and (“2.5” – “2.4”) (= 0.1) |  |
|  |  |  | C1 | for Yes with fully correct figures eg 4 or 0.96, or 0.125 **and** 0.1 |  |
| 7 |  | showing that  *a* : *c* = 5 : 9 | C1 | for using a common multiple of 3 and 5, eg. 15 giving  *a* : *b* = 10 : 15 and *b* : *c* = 15 : 18 | These may be seen in lists of equivalent ratios for each ratio |
|  |  |  | C1 | for *a* : *c* = 10 : 18 = 5 : 9 |  |
| 8 |  | 36.6 | P1 | for (*AB*2 =) 5.62 + 3.92 |  |
|  |  |  | P1 | for (= 6.82..) |  |
|  |  |  | P1 | for |  |
|  |  |  | A1 | for answer in the range 36.2 to 36.6 |  |
| 9 | (a) | 0.49 | M1 | for a method to find the gradient of the line, eg. 36 ÷ 80 | Use of change in *y* over change in *x* |
|  |  |  | A1 | for answer in the range 0.4 to 0.5 |  |
|  | (b) | number of kg in a pound | C1 | for statement that the gradient represents the conversion factor from kg into pounds |  |

| **Paper: 1MA1/2H** | | | | | |
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| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 10 | (a) | 4, 20, 50, 68, 80 | B1 | cao |  |
|  | (b) | cf graph | M1 | for 4 or 5 of their points plotted correctly from a cf table | Ignore anything drawn to the left of the first point |
|  |  |  | A1 | for a fully correct cf graph  SC B1 for 4 or 5 of their points plotted not at the end but consistent within each interval and joined, providing no gradient is negative | May be a cumulative frequency curve or a cumulative frequency polygon  If histograms drawn, plots must be identified |
|  | (c) | 33 | B1 | for answer in the range 32.5 to 34 or ft their cf graph |  |
|  | (d) |  | M1 | for where *n* is in the range 58 to 64 or ft their cf graph |  |
|  |  |  | A1 | for answer in the range to or 0.2 to 0.275 ft their cf graph | Accept any equivalent fraction, decimal or percentage ft |
| 11 |  | 120 000 | M1 | for a correct use of 1.015, eg. 123 627 ÷ 1.015 (= 121 800)  or 123 627 ÷ 1.0152 (= 120 000) |  |
|  |  |  | A1 | cao |  |
| 12 |  | *x*3 + 6*x*2 – 7*x* – 60 | M1 | for method to find the product of any two linear expressions (3 terms correct or 4 terms ignoring signs) | Note that, for example, *x*2 + 2*x*  or 2*x* ‒ 15 is regarded as three terms in the expansion of (*x* + 5)(*x* ‒ 3) |
|  |  |  | M1 | for method of multiplying out remaining products, (half of which are correct) ft their first product | First product must be quadratic but need not be simplified or may be simplified incorrectly |
|  |  |  | A1 | cao |  |
| 13 | (a) | I | B1 | cao |  |
|  | (b) | D | B1 | cao |  |
|  | (c) | A | B1 | cao |  |
| 14 |  | Proof | C1 | for angle *MCB* = angle *NBC* since base angles of an isosceles triangle are equal |  |
|  |  |  | C1 | for *MC = NB* since *AC* = *AB* , |  |
|  |  |  | C1 | for a complete proof including *BC* is common to both triangles and SAS as the condition of congruency |  |
| 15 | (a) | – 26 | B1 | cao |  |
|  | (b) |  | M1 | for a start of the process to find eg *x* ‒ 1 or 3√ |  |
|  |  |  | A1 | cao |  |
| 16 |  | 5 | P1 | for 0.8 × 0.3 (= 0.24) **or** 0.2 × 0.05 (= 0.01) | Accept fractions in working |
|  |  |  | P1 | for “0.24” + “0.01” (= 0.25)  **or** “0.24” × 20 (= 4.8)  **or** “0.01” × 20 (= 0.2) |  |
|  |  |  | A1 | cao |  |
| 17 |  | 35 | P1 | for tan *c* = or cos *d* = |  |
|  |  |  | P1 | for process to set up an algebraic fraction equation and eliminating fractions to give a linear equation,  eg. for a complete process to solve their equation,  eg. oe  or 8 + 9 = 18*x* or *x* = 17 ÷ 18 (= 0.944…) |  |
|  |  |  | P1 | (dep P2) for using their value of *x* to find *c*, eg. *c* = tan-1 oe |  |
|  |  |  | A1 | for angle between 35 and 36 |  |
| 18 |  | 3, – 2 | M1 | for method to find value of *a,* eg. finding 2nd differences of 6 and dividing by 2 (= 3)  **or**  for method to solve two of the equations from; *a* + *b* = 1,  4*a* + 2*b* = 8, 9*a* + 3*b* = 21 , 16*a* + 4*b* = 40 , 25*a* + 5*b* = 65 |  |
|  |  |  | M1 | Substituting *a* = “3” into one of the above equations, eg. *a* + *b* = 1 |  |
|  |  |  | A1 | cao |  |

| **Paper: 1MA1/2H** | | | | | |
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| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 19 |  | 4.7  (supported) | M1 | for one correct bound from, 119.5, 120.5, 25.55, 25.65 | for *m* accept or 120.499…  for *f* accept or 25.499… |
|  |  |  | M1 | for a correct method to find one bound of *T*,  eg [UB of *T*] = [UB of *m*] ÷ [LB of *f*]  **or** [LB of *T*] = [UB of *m*] ÷ [UB of *f*] | 120 < [UB of *m*] ≤ 120.5  119.5 ≤ [LB of *m*] < 120  25.6 < [UB of *f*] ≤ 25.65  25.55 ≤ [LB of *f*] < 25.6 |
|  |  |  | A1 | for 4.716.. and 4.658.. from correct working | Accept bounds rounded or truncated to at least 4 sf |
|  |  |  | C1 | for 4.7 from 4.716.. and 4.658.. with a supportive reason  eg because both values round to 4.7 correct to one decimal place |  |
| 20 |  | 10.7 | P1 | for the start of a process to find the radius, eg. sin 25 = | For process marks accept figures rounded or truncated to one decimal place. |
|  |  |  | P1 | for a complete process to find the radius, eg. 6 ÷ sin 25 (= 14.197..) |  |
|  |  |  | P1 | for process to find area of triangle *OAC,*  eg. 0.5 × “14.197..”2 × sin 50  or 6 × 6 ÷ tan 25 (= 77.20..) |  |
|  |  |  | P1 | for process to find area of sector *OABC,*  eg. (= 87.947..) |  |
|  |  |  | A1 | for answer in the range 10.6 to 10.9 |  |

| **Paper: 1MA1/2H** | | | | | |
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| **Question** | | **Answer** | **Mark** | **Mark scheme** | **Additional guidance** |
| 21 |  | 6, 2 | M1 | For using *x*0 = 1 with the *y-*intercept to derive the equation 6 = *a* × 1 |  |
|  |  |  | M1 | for 0.75 = 6 × |  |
|  |  |  | A1 | cao |  |
| 22 |  | 432.18 | P1 | for a process to find the ratio of height of **A** to **B**,  eg. |  |
|  |  |  | P1 | for a process to find the ratio of volume **A** to volume **C**,  eg. 23 : 73 (= 8 : 343) |  |
|  |  |  | P1 | for process to find volume of **C**,  eg. 72 (= 3087) |  |
|  |  |  | P1 | for “3087” × 0.14 |  |
|  |  |  | A1 | accept an answer in the range 432 to 432.2 |  |
| 23 |  | 3 < *x* < 4 ,  – 4 < *x* < – 3 | M1 | for a correct method to begin rearranging to solve for *x*2,  eg. 5 < *x*2 – 4 or *x*2 – 4 < 12 | Accept incorrect inequality signs used or the use of equality signs |
|  |  |  | M1 | for a set of critical values; at least two out of 3, 4, – 3, – 4 |  |
|  |  |  | M1 | for inequalities for one set of critical values, eg. *x* > 3 and *x* < – 3  or *x* < 4 and *x* > – 4 |  |
|  |  |  | A1 | for 3 < *x* < 4 , – 4 < *x* < – 3 | Do not award marks for answer if not supported by working. |

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