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

**Mark Scheme**

Mock Set 2

Pearson Edexcel GCSE Mathematics (1MA1)

Higher Tier (Calculator)

Paper 2H



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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 |

**Higher tier Paper 2H (Calculator): Mock (Set 2) Mark Scheme**

| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 |  |  | 11 | P1  | Process to find total cycling,, e.g. 100 – 52 – 35 (= 13)  |
|  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | G | R | C | T |
| M | **22** | **24** | 9 | **55** |
| F | 30 | **11** | **4** | 45 |
| T | 52 | 35 | **13** | 100 |

 | P1 | Complete process to find female running, e.g. 45 – (30 + (“13” −9))  |
|  |  | A1 | cao |
|  |  |  | OR |
|  |  | P1 | process to find male Gym (22) **or** male total (55) |
|  |  | P1 | complete process to find female running, e.g. 35 – (“55” – “22” – 9) |
|  |  |  |  | A1 | cao |
|  |  |  |  |  | Note: the two-way table (or frequency tree) does not need to be fully complete |
| 2 |  |  | 39% | P1 | process to find proportion of group that are students , e.g.  |
|  |  |  |  | P1 | complete process to find the % of girls , e.g.  |
|  |  |  |  | A1 | for 39(.0625)  |
|  |  |  |  |   | OR |
|  |  |  |  | P1 | process to scale up the ratio of teachers : students, so that students can be divided by 7+5 (=12),, e.g. 1 × 12 : 15 × 12 = 12 : 180 or a process to divide the “180” in the ratio 7:5,, e.g. 180 ÷ 12 × 7 (=105) **and** 180 ÷ 12 × 5 (=75) |
|  |  |  |  | P1 | complete process to find the % of girls , e.g. (75 ÷ (12+105+75)) × 100  |
|  |  |  |  | A1 | for 39(.0625)  |
| 3 |  |  | construction | B2 | correct construction showing all necessary arcs. |
|  |  |  |  | (B1) | (pair of intersecting arcs centred on *A* and *B*) |
| 4 | (a) |  | –1.2 & 3.2 | B2 | for both roots correct  |
|  |  |  |  | (B1) | (for one correct root) |
|  | (b) |  | (1, –5) | B1 | cao |
| 5 |  |  | 134 | P1 | process to find the distance around one or both ends of the track, e.g. π × 54 (= 169.6460033) or ( π × 54) ÷ 2 (= 84.82300165) |
|  |  |  |  | P1 | (dep on P1) complete process to find the total length of the track, e.g. 40 × 2 + “169.6460033” (= 249.6460033)  |
|  |  |  |  | P1 | process to find the circumference of wheel, e.g. π × 590 (=1853.539666 mm) or π ×0.59 (= 1.85353966 m) |
|  |  |  |  | P1 | complete process to find the number of revolutions in consistent units,, e.g. “249.64…” ÷ “1.85…” or unrounded answer of 134.6860863 |
|  |  |  |  | A1 | cao |
| 6 |  |  | Elevation | B2 | fully correct side elevation |
|  |  |  | (B1) | (a rectangle 4 high by 2 wide) |
| 7 | (a) |  | Shown | M1 | for distance ÷ speed to find time, e.g. (1.496 × 1011) ÷ (3 × 108) (= 498.666) |
|  |  |  |  | M1 | (dep) for conversion to hours, e.g. “498.666” ÷ (60 × 60) |
|  |  |  |  | A1 | 0.1385185185… |
|  | (b) |  | Explanation | C1 | correct explanation, e.g. they have multiplied the indices rather than adding |
| 8 |  |  | *y* = 3*x* – 1 | M1 | for *y* = 3*x* + *c*  or a line drawn with gradient 3 passing through *A* |
|  |  |  |  | A1 | oe |
| 9 | (a) |  | Lauren£9537.20£9545 | P1 | process to find the value of one car at the end of one year,e.g. 13995 × 0.88 **or** 14495 × 0.87 |
|  |  |  |  | P1 | process to find the value of one car at the end of 3 years, e.g. 13995 × (0.88)3 **or** 14495 × (0.87)3 |
|  |  |  |  | P1 | complete process to find the value of both cars at the end of 3 years,e.g. 13995 × (0.88)3 **and** 14495 × (0.87)3 |
|  |  |  |  | C1 | £9537.20(064) and £9545(.000985) and Lauren |
|  | (b) |  | Explanation | C1 | appropriate explanation, e.g. explanation that her car will be worth less |
| 10 | (a) |  | 72 – 80 | M1 | for a single line segment with a positive gradient that could be used as a line of best fit or a horizontal line from 740 or a point plotted at (*x*, 740) where *x* is in the range 72 – 80 |
|  |  |  |  | A1 | answer in range 72 – 80 |
|  | (b) |  | Explanation | B1 | explanation, e.g. 110 cm is outside of the range of the data, the line of best fit cannot be extended that far |
| 11 |  |  | 4.7805 × 107 | B1 | cao |
| 12 |  |  | (*x* + 11)(*x* – 11) | B1 | cao |
| 13 |  |  | Reasons | B1 | e.g. Median plotted incorrectly |
|  |  |  |  | B1 | e.g. Range plotted rather than maximum or maximum nor plotted |
| 14 |  |  | *x* = – 4 *y* = 3.5 | M1 | process to eliminate one variable or rearrangement of one equation leading to substitution (condone 1 arithmetic error) |
|  |  |  | A1 | for either *x* = – 4 or *y* = 3.5 |
|  |  |  |  | M1 | (dep on M1) correct substitution of found value or a correct process after starting again (condone one arithmetic error) |
|  |  |  |  | A1 | cao |
| 15 |  |  | Proof | M1 | correct expansion or factorisation of a suitable expression for 2 consecutive integers,, e.g. (*n* + 1)2 – *n*2 = *n*2 + 2*n* + 1 – *n*2 or (*n* + 1)2 – *n*2 = (*n* + 1 + *n*)(*n* + 1 – *n*) |
|  |  |  |  | A1 | expansion or factorisation correctly simplified,, e.g. 2*n* + 1 or 2*n* + 3 |
|  |  |  |  | C1 | correct conclusion drawn from fully correct working |
| 16 |  |  | Enlargement, scale factor –2, centre (4, 6) | B2  | enlargement, scale factor –2, centre (4, 6) |
|  |  |  | (B1) | (for 2 correct aspects)NB score B0 for more than one transformation |
| 17 |  |  | No with justification | P1 | for one correct bound, e.g. 69.5, 70.5, 39.5, 40.5, 121.5, 122.5, 13.5, 14.5 |
|  |  |  |  | P1 | for complete process to find the upper bound for the volume of the tank, e.g. 120.5 × 40.5 × 70.5 (= 344057.625) |
|  |  |  |  | P1 | for complete process to find the upper bound for the number of buckets, (upper bound for volume of tank ÷ lower bound for volume of bucket)e.g. “344057.625” ÷ 13500. Must be in consistent units **OR** correct process to compare the lower bound for 25 buckets of water with the upper bound for the volume of the tank, e.g. 13.5 × 1000 × 25 (= 337500)  |
|  |  |  |  | C1 | correct conclusion based on correct calculations |
| 18 |  |  | 2 | M1 | *T* =  or 0.0096 =  or *T* =   |
|  |  |  |  | M1 | method to find *u*, e.g.  |
|  |  |  |  | A1 | cao |
| 19 |  |  | (– 5, – 7) | M1 | method to start to complete the square, e.g. (*x* + 5)2 |
|  |  |  |  | M1 | (*x* + 5)2 – 7 |
|  |  |  |  | A1 | cao (dep on method seen) |
| 20 |  |  |  | M1 | for *ACD* = 54°, or *ADC* = 66° (may be on diagram) |
|  |  |  |  | A1 | for *CAD* = 60° from correct working |
|  |  |  |  | C2 | C2 for all correct reasons stated |
|  |  |  |  | (C1) | (C1 for one appropriate reason linked to a circle theorem used) |
|  |  |  |  |  | Alternate segment theorem. Opposite angles of a cyclic quadrilateral add up to 180.Angles in a triangle add up to 180Angles on a straight line add up to 180 |
| 21 |  |  |  | M1 | gf(*x*) =  or f(4) = 48 |
|  |  |  |  | A1 | oe |
| 22 |  |  | *c* = *a*2 + 8*d* = 4*a* | P1 | process to expand (*a* + √8)2 given at least 3 terms correct |
|  |  |  | A1 | *c* = *a*2 + 8 |
|  |  |  | A1 | *d* = 4*a* |
| 23 | (a) |  | shown | M1 | method to find at least one root in [0, 1], e.g. 2*x*3 + 4*x* –3 (= 0) and f(0) (= –3), f(1) (= 3) oe or f(0) = 0 and f(1) = 6 |
|  |  |  |  |   | since there is a change in sign there must be at least one root in 0 < *x* < 1 (as f is continuous), or 0 and 6 are either side of 3 |
|  | (b) | 4*x* = 3 – 2*x*3*x* =  *x* =  | shown | C1 | for correct steps leading to rearranged equation |
|  | (c) | *x*1 = 0.75*x*2 = 0.5390625*x*3 = 0.671677351 | 0.671677351 | M1 | for one correct iteration |
|  |  |  | M1 | for two further iterations |
|  |  |  | A1 | for 0.671(677351) |
| 24 |  |  | 12.3 | P1 | for process to start, e.g. correct substitution into ½ *ab* sin *C*, e.g. 0.5 × *7* × *BC* × sin70 = 42 |
|  |  |  |  | P1 | (dep on P1) for process to rearrange to find *BC*,e.g. *BC* =  oe (= 12.77013327) |
|  |  |  |  | P1 | (dep on first P1) for process to find *AB*, e.g. *AB*2 = 72 + “*BC*”2 – 2 × 7 × “*BC*” × cos 70 |
|  |  |  |  | P1 | for correct order of operations or 150.929(30436946) |
|  |  |  |  | A1 | for answer in range 12.28 – 12.3 |
| 25 |  |  | 9 | P1 | for process to start to solve problem, e.g.  or  |
|  |  |  |  | P1 | for a correct product, e.g.  |
|  |  |  |  | P1 | for processes to arrive at correct quadratic, e.g. 21*x*2 – 287*x* + 882 = 0 |
|  |  |  |  | P1 | (dep on P2) correct substitution into the quadratic formula or factorisation of their quadratic |
|  |  |  |  | A1 | cao |