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

**Mark Scheme (Results)**

November 2017

Pearson Edexcel GCSE (9 – 1)

In Mathematics (1MA1)

Higher (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.

**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.

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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**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** | **Working** | **Answer** | **Mark** | **Notes** |
| 1 |  |  |   | M1 | for correct expansion of the bracket or dividing all terms by 3 as a first step eg 3*x* −3 or (5*x* – 6)/3 = 3(*x* – 1)/3 |
|  |  |  |  | M1 | for isolating terms in *x* on one side of an equation eg 5*x* – 6 – 3*x* = −3 or both constants on one side of an equation, eg 5*x* = 3*x* − 3 + 6 ,ft 5*x* – 6 = 3*x* – 1 |
|  |  |  |  | A1 | for  oe |
| 2 |  | £6 − £5.64 = 36p or50p – 47p = 3p | 6.4 | P1 | for a strategy to compare the same number of bottles e.g. £5.64 ÷ 12 ( = 47 or 0.47) or 12 × 50p (= 6 or 600) or 36 or 0.36 or 3 or 0.03 |
|  |  |  |  | P1 | for start of process to find percentage profit e.g.  or  or  or  oe with consistent units |
|  |  | 6.3829787…% |  | A1 | for answer in the range 6.3 to 6.4 |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 3 | (a) |  | 31.4 | P1 | for working with circumference formula, eg π × 80 (=251. …) oe |
|  |  |  |  | A1 | for answer in the range 31.4 to 31.5 accept 10*π* |
|  | (b) |  | No (supported) | C1 | Mean distance stays the same with reason, eg total distance remains unchanged or same number of points |
| 4 |  |  |   | P1 | for starting the process, eg by writing down a correct ratio or using a given number of cubes for one relationship, eg 2B 1Y or B:Y = 2:1 or 4G 1B or G:B = 4:1 or 8G, 1Y or G:Y = 8:1 oe or yellow = 2, blue = 4, or states 2:1:8 oe in any order (can be algebraic) |
|  |  |  |  | P1 | for complete process to find possible number of each colour or equivalent ratio, eg 8G 2B 1Y or G:B:Y = 8:2:1 oe or yellow = 2, blue = 4, green = 16 oe (can be algebraic) |
|  |  |  |  | A1 |   oe |
| 5 | (a) |  | (−2, 1) (−4, 1)(−2, 2) (−5, 2) | B1 | Shape labelled **A** |
|  | (b) |  | (1, −4) (3, −4)(1, −5) (4, −5) | B1 | Shape labelled **B** |
| 6 | (a) |  | 6 | B1 | cao |
|  | (b) |  | 5 | B1 | cao |
|  | (c) |  | Shown | M1 | for writing 100*a* or 1000*b* as a power of 10 (=102*a* or 103*b*) or 102*a +* 3*b*  or 100 = 10² and 1000 = 10³  |
|  |  |  |  | C1 | for complete chain of reasoning leading to conclusion |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 7 |  |  | 32.3 | P1 | for using Pythagoras to find length of third side of triangle, eg 7.52 – 62 or 62 + *x*2 = 7.52 or uses trigonometry to find angle in triangle, eg sin *A* =  or cos *B* =  |
|  |  |  |  | P1  | (dep P1) for complete process to find length of third side of triangle eg  or  or  (= 4.5) or uses trigonometry to find base length of triangle, eg 7.5 × cos ”*A*” or 7.5 × sin “*B*” or $\frac{6}{tan"A"}$ |
|  |  |  |  | P1 | (dep P2) for 24 – 10 – “4.5” (= 9.5) |
|  |  |  |  | P1 | (indep) for process to find angle *CDA*, eg tan *CDA* = $\frac{6}{base}$ from right- angled triangle |
|  |  |  |  | A1 | for answer in the range 32.2 to 32.3 |
| 8 | (a) |  | 2.7560… | M1 | for 1.0654(059…), 0.1402(633…), 7.5957(541…), 2.756 truncated or rounded to no less than 2dp |
|  |  |  |  | A1 | for 2.7560(….) |
|  | (b) |  | 2.76 | B1 | for 2.76 ft from (a) |
| 9 |  |  | 65.60 | P1 | for start in using inverse proportionality, eg 5 × 4.5 (= 22.5) or 4.5 = $\frac{k}{5}$ or 5 × 4.5 × 60 (= 1350) or $\frac{5}{3}$ or $\frac{3}{5}$ |
|  |  |  |  | P1 | for process to find number of hours for each cleaner today, eg $\frac{22.5}{3}$ (= 7.5)  |
|  |  |  |  | A1 | for 65.6(0)(SC B2 for 61.5(0)) |
| 10 | (a) |  | 0 to 20 seconds  | B1 | for between 0 seconds and 20 seconds |
|  |  |  | with reason | C1 | for reason given eg gradient is greatest oe |
|  | (b) |  | 18 | B1 | ft from (a) |
| 11 |  |  | 0.119 | P1 | for starting the process, eg finds area 25π or 16π oe, or finds angle for town A, 0 – 19 (70°), may be on diagram |
|  |  |  |  | P1 | for a complete process, eg $\frac{70}{360}$ × $\frac{25π}{41π}$ |
|  |  |  |  | A1 | 0.118 – 0.119 or 11.8% - 11.9% |
| 12 |  |  | 15 | P1 | for a process to find the interior or exterior angle of a regular 12 sided polygon e.g. $\frac{10×180 }{12}$ (= 150) or $\frac{360}{12}$ (= 30), must be no contradictions |
|  |  |  |  | P1 | for process to find angle *STR*, eg $\frac{180-"150" }{2}$ or $\frac{"30"}{2}$ |
|  |  |  |  | A1 | cao |
| 13 | (a) |  | 58600 | M1 | for a complete method, eg 50000 × 1.028 (= 58582(.969...)) or for finding the increase in value of the company after 8 years,eg 8582(.969...) or 8600 |
|  |  |  |  | A1 | cao |
|  | (b) |  | 4.5 | P1 | for a process to find multiplier for 6 year period, eg 325 ÷ 250 oe (= 1.3) or 130(%) or for 250000 × $y^{6}$ = 325000 |
|  |  |  |  | P1 | for a process to find multiplier for one year, eg ($"1.3")^{\frac{1}{6}}$ or 1.044…or 1.045 |
|  |  |  |  | A1 | 4.4 – 4.5 |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 14 |  |  | Region R shaded | M1 | for two of the lines *y* = 1, *x* + *y* = 5, *y* = 2*x* correctly drawn |
|  |  |  |  | M1 | for three lines correctly drawn |
|  |  |  |  | A1 | for fully correct region indicated with all lines correct |
| 15 | (a) |  | No with reason | C1 | for “no” with reason, eg Tracey should multiply 8 and 7 |
|  | (b) |  | 66 | M1 | for starting a method to find number of games played, eg 12 × 11 (= 132) or sum of integers from 1 to 11 |
|  |  |  |  | A1 | cao |
| 16 |  | $$\frac{--4\pm \sqrt{\left(-4\right)^{2}-4×1 ×1}}{2×1}$$ | 0.268, 3.73 | M1 |  for *x* – 2 = ±√3 oe or one solution or use of *x*² – 4*x* + 1 = 0 to substitute into formula (allow one error in substitution) |
|  |  |  |  | A1 | 0.267 – 0.27, 3.7 – 3.74 |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 17 | (a) | 1.5, 6, 10.2, 7.2, 1.2 | Histogram drawn | C1 | for 2 correct bars of different widths or at least 3 correct frequency densities. |
|  |  |  |  | C1 | for all bars in correct proportions or 4 correct bars with axes scaled and labelled. |
|  |  |  |  | C1 | for fully correct histogram with axes scaled and labelled.  |
|  | (b) |  | $$\frac{123}{150}$$ | M1 | for a method to find number of students in interval, eg 30 + 51 + 36 + $\frac{1}{3}$ × 18 (= 123) or 150 − 15 − $\frac{2}{3}$ × 18 (= 123) |
|  |  |  |  | A1 | for $\frac{123}{150}$ oe or 0.82 or 82% |
| 18 |  |  | 0.98 | B1 | cao |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 19 |  |  | Proof(supported) | M1 | for a method to find coordinates of *M*(−1, −1) or *N* (3, 1) |
|  |  |  |  | M1 | for method to find gradient of *MN* or *PR* or for method to find column vector for $MN$ or *PR* or for differences of *x* coordinates and differences of *y* coordinates for *MN* or *PR* |
|  |  |  |  | A1 | for gradients of *MN* and *PR ,* ie½ oe or for column vectors of *MN* and *PR*, $\vec{MN }$ $= \left(\genfrac{}{}{0pt}{}{4}{2}\right)$ and $\vec{PR }$ $=\left(\genfrac{}{}{0pt}{}{8}{4}\right)$ or for differences of *x* coordinates and of *y* coordinates for *MN* and*PR* |
|  |  |  |  | C1 | for conclusion from reasoning and correct working |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 20 |  |  | 68.5 | B1 | for angle *OAB* = 90° or angle *OCB* = 90°, may be seen on diagram |
|  |  |  |  | P1 | for a process to find the length of *AB* or the length of *CB* (= 10√3 oe)eg 10 × tan 60° (= 17.3...) or the length of *OB* (= 20), eg 10 ÷ cos 60° |
|  |  |  |  | P1 | for a process (dep previous P1) to find the area of the triangle *OAB* (= 50√3 oe) or area of triangle *OCB* (= 50√3 oe) or area of kite *OABC* (= 100√3 oe) |
|  |  |  |  | P1 | for a process to find the area of the sector *OAC* e.g. $\frac{1}{3}$ × π × 10² (= 104.7...),accept rounded or truncated to 3 significant figures or more |
|  |  |  |  | A1 | for 68.4 − 68.6 |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 21 | (a) |  | $$\frac{1}{55}$$ | M1 | for $\frac{4}{12} $× $\frac{3}{11}$ × $\frac{2}{10}$ |
|  |  |  |  | A1 | for $\frac{1}{55}$ oe |
|  | (b) |  | Conclusion (supported) | C1 | starts correct argument, eg by calculating a relevant probability,eg $\frac{5}{15}$ × $\frac{4}{14}$ × $\frac{3}{13}$  |
|  |  |  |  | C1 | statement of “more likely” from eg comparison of probabilities, ft answer to (a) eg $\frac{1}{55}$ (= 0.018…) and $\frac{2}{91}$ (= 0.021…or 0.022) |
| 22 |  |  | 7, −1 | P1 | for strategy to use g(3) = 20, e.g. 3*a* + *b* = 20 |
|  |  |  |  | P1 | for g(1) = *a* + *b* |
|  |  |  |  | P1 | for a process to find inverse of f. e.g. f−1(*x*) =$\frac{x-3}{5}$ or f−1(33) = 6 |
|  |  |  |  | P1 | for using f−1(33) = g(1) to find an equation e.g. $\frac{33-3}{5}$ = *a* + *b* |
|  |  |  |  | A1 | for *a* = 7, *b* = −1 |
| 23 | (a) |  | 2 | M1 | for start to express the common ratio algebraically, eg 1/($\sqrt{x}$ - 1)$ or$ $(\sqrt{x}+1)/1$ or $\sqrt{x}+1$ = *k* × 1 or 1 = *k* ×($\sqrt{x}$ – 1) |
|  |  |  |  | M1 | for setting up an appropriate equation in *x*, eg 1/($\sqrt{x}$ - 1)$=$ $(\sqrt{x}+1)/1$  |
|  |  |  |  | C1 | for convincing argument to show *x* = 2 |
|  | (b) |  | Shown | M1 | for expressing the relationship between the common ratio, one of the first three terms of the sequence and the fifth term, eg 5th term = 3rd term × (common ratio)² |
|  |  |  |  | C1 | for a complete explanation to include eg, ($\sqrt{2}$ +1)($ \sqrt{2}$ +1)² = 7 + 5$\sqrt{2}$ |

Q14

1

2

3

4

5

6

-1

-2

-3

-4

-5

-6

1

2

3

4

5

6

7

-1

-2

-3

-4

-5

-6

*O*

*x*

*y*

*y* = 2*x*

*x* + *y* = 5

*y* = 1

**R**

**Modifications to the mark scheme for Modified Large Print (MLP) papers.**

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:

Angles: ±5º

Measurements of length: ±5 mm

| **PAPER: 1MA1\_2H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 3 |  | Both diagrams enlarged and put on the same page in the diagram book. Wording changed to ‘There are 8 points equally spaced on the circumference of the circle, as shown in the diagram for Question 18(a)’.Wording changed to ‘Four of the points are moved, as shown in the diagram for Question 18(b)’. | Standard mark scheme |

| **PAPER: 1MA1\_2H** |
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| **Question** | **Modification** | **Mark scheme notes** |
| 5 |  | The grid has been split into two parts for part (a) and part (b). |  |
| 5 | (a) | Question reversed.Trapezium T and A have been put on a grid. Question wording changed to ‘It shows trapezium T and trapezium A given on a grid. Describe the single transformation that maps trapezium T onto trapezium A’.3 answer lines and have been provided | B1 for “Rotation 180° about the origin” |
|  |  |  |  |

| **PAPER: 1MA1\_2H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 5 | (b) | Question reversed.Question wording changed to ‘It shows trapezium T and trapezium B given on a grid. Write down the vector that translates trapezium T onto trapezium B.’Vector brackets have been provided. | B1 for   |
|  |  |  |  |

| **PAPER: 1MA1\_2H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 6 | (c) | MLP and braille: a changed to e, b changed to f. | Standard mark scheme but for Braille letters changed as indicated. |
| 7 |  | Diagram enlarged. Arrows have been removed from 10cm and 6cm. Wording added ‘BC = 10cm, AB = 7.5cm, AD = 24cm. The vertical height of the trapezium is 6cm.’ | Standard mark scheme. |

| **PAPER: 1MA1\_2H** |
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| **Question** | **Modification** | **Mark scheme notes** |
| 10 |  | Diagram enlarged. Right axis has been labelled.Graph line moved to go through (20, 400) (60, 600) (80, 600).Axes labels moved to the left of the horizontal axis and above the vertical axis. | Standard mark scheme but in (b) the answer is 20 |
|  |  |  |  |

| **PAPER: 1MA1\_2H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 11 |  | Diagrams enlarged × 2 but angles have been kept the same size. | Standard mark scheme but P1 areas are 100π and 64πP1 working is   |
| 12 |  | Diagram enlarged. Dashes made longer and thicker. | Standard mark scheme |
| 14 |  | Diagram enlarged. List of inequalities stacked vertically. | Standard mark scheme |
| 17 |  | Numbers on the table have changed from 51 to 50, 36 to 40 and 18 to 15.In (a) grid enlarged. | Standard mark scheme in (a) using amended figures.In (b) M1 for a method to find number of students in intervaleg 30 + 50 + 40 + 1/3 × 15 or 150 − 15 − 2/3 × 15A1 for 125/150 or 0.83 – 0.84 or 83 - 84% |
| 20 |  | Diagram enlarged. Shading has changed to dotty shading.Angle moved outside the angle arc and the angle arc made smaller. | Standard mark scheme |
| 23 | (a) | MLP and braille: *x* changed to *y*. | Standard mark scheme but for braille note change of letters. |

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