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

Mark Scheme (Results)

Summer 2019

Pearson Edexcel GCSE (9 – 1)

In Mathematics (1MA1)

Higher (Non-Calculator) Paper 1H

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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.

|  |
| --- |
| **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** |
| --- |
| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 1 | (a) | 0.4, 0.4 | P1 | for process to find sum of unknown probabilities, eg 1 – 0.2 (= 0.8) | Award mark for any two probabilities given that sum to 0.8, eg given in the table |
|  |  |  | A1 | oe | Accept any equivalent fraction or 40% |
|  | (b) | 60 | P1 | for complete process to find total number of cubes, eg 12 ÷ 0.2 **or** 12 × 5 **or** (“0.4” ÷ 0.2) ×12 + (“0.4” ÷ 0.2) ×12 + 12**OR** states 0.1 = 6 **or** 0.4 = 24 |  |
|  |  |  | A1 | cao |  |
| 2 | (a) | 600 | P1 | for starting process to calculate amount of floureg 60 ÷ 15 (= 4) **or** 3 × 50 (= 150) | 4 implied by 200g of sugar |
|  |  |  | P1 | for complete process eg × “150” |  |
|  |  |  | A1 | cao |  |
|  | (b) | 2 | P1 | for process to calculate amount of butter eg × 2 × 50 (= 400)**OR** for process to calculate the number of packs of butter needed eg [butter] ÷ 250  | [butter] must be clearly stated or calculated, may be seen in part (a)  |
|  |  |  | A1 | cao | 2 must not come from incorrect working |
|  |  |  |  |  |  |
| 3 |  | 18 | M1 | for listing factors of 72 and 90, at least 4 correct for each (with no more than 1 incorrect in each list), could be in factor pairs**OR** for the prime factors of 72 (2, 2, 2, 3, 3) **or** 90 (2, 3, 3, 5) | Factors of 72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72Factors of 90: 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90 |
|  |  |  | A1 | for 18 or 2×32 oeSC B1 for answer of 6 or 9 if M0 scored | 2, 32 is not enough, it must be a product |
| 4 |  | sketch | M1 | for sketch of a cylinder | Hidden edges may or may not be shown |
|  |  |  | A1 | sketch of cylinder, with dimensions shown | 2 (cm) for radius or 4 (cm) for diameter and 5 (cm) for height |
| 5 |  | *c* = −6*d* = −1 | M1 | for reflection in *x*-axis shown on diagram | Vertices (3, −2), (5, −2), (3, −5) |
|  |  |  | A1 | for *c* = −6 or *d* = −1 | One correct value is M1A1 regardless of second value or diagram |
|  |  |  | A1 | for both *c* = −6 and *d* = −1SCB2 for *c* = −1 and *d* = −6 |  |
|  |  |  |  |  |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 6 |  | 96 | P1 | for process to find the ratio of the number of pens of each colour sold, eg 2 × 7 : 5 × 3 : 6 × 4 (= 14 : 15 : 24)  | Does not have to be seen as a ratio but all three needed |
|  |  |  | P1 | for process to find the proportion of green pens sold, eg  **or**  |  |
|  |  |  | P1 | for a complete process to find the number of green pens sold, eg × “24” **or**  × 212 | P3 can be implied by the values 56, 60 and 96 |
|  |  |  | A1 | cao |  |
| 7 |  | 8.5 | P1 | for process to use the area of *PQRS* to find the length of *PQ,*eg 10*y* = 45 **or** 45 ÷ 10 (= 4.5) | Sets up equation for area  |
|  |  |  | P1 | for process to use the perimeter of *ABCD*,eg 2*x* + 2*×* “4.5” = 26 **or** 26 – 2 × “4.5” (= 17) **or** 26 ÷ 2 (= 13) | Uses perimeter of *ABCD* |
|  |  |  | P1 | for process to use length of *BC* to find length of *AB*, eg solves 2*x* + 2*×* “4.5” = 26 **or** (26 – 2 × “4.5”) ÷ 2 **or** “13” – “4.5” |  |
|  |  |  | A1 | for 8.5 **or** 8 | Accept  |
|  |  |  |  |  |  |
| 8 | (a) | 75 to 81 | B2 | for answer in the range 75 to 81 |  |
|  |  |  | (B1 | for 60 **or** 100 **or** 6000 **or** 6400 **or**) |  |
|  | (b) | 0.000 148 | B1 | for 0.000 148 oe | Can use standard form |
|  | (c) |  | B1 | for or 0.04 |  |
| 9 |  | 5 | M1 | for writing as improper fractions with at least one correct, eg × oe |  |
|  |  |  | M1 | (dep) for multiplying improper fractions, eg  **or** 5 **or** oe |  |
|  |  |  | A1 | cao |  |
| 10 |  | *x* = 2.2 to 2.3*y* = −1.3 to −1.4 | M1 | for recognition of use of intersection point, one of the solutions given, solutions reversed or solutions given as a coordinate. |  |
|  |  |  | A1 | *x* given in the range 2.2 to 2.3, *y* given in the range −1.3 to −1.4 |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 11 | (a) | 59, 53, 66 | B2 | for Median = 59, LQ = 53, UQ = 66, may be seen in working |  |
|  |  |  | (B1 | for one correct) |  |
|  | (b) | Yes, with reason | C1 | for Yes and comment comparing median ages, ft from (a)**Acceptable examples** “59” < 70All statistics/values are lower for coach A (so they are younger)Median is lowerThe middle age is lower on coach A**Not acceptable examples**Median is higherMedian for coach A is “59” and coach B is 70The oldest on coach A is 79 and the oldest on coach B is 85There are people on coach B that are older than on coach A |  |
|  | (c) | No, with reason | C1 | for No and comment comparing spreads of ages from ranges or IQRs, ft from (a)**Acceptable examples**38 < 43 **or** “13” < 19Greater difference between greatest and least age for coach BRange for coach B is larger than coach AThe range of ages is wider on coach B than on coach AThe range is 5 greater on coach BThere is a smaller difference between the lower and upper quantiles on coach A than on coach BThe IQR is shorter for coach A **Not acceptable examples**Quartiles are less for coach A53 < 54 **or** 79 < 85 (oe)Range for coach A is 38 and range for coach B is 43Coach A ranges from 41-79 but coach B ranges from 42-85 | WorkingA: Range = 38, IQR = “13”B: Range = 43, IQR = 19 |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 12 |  |  | P1 | for process to find link between volume of Q and volume of P **or** between volume of R and volume of Q, eg ratio 1.5 : 1 **or** Q = 1.5P **or** P = Q **or** two values in the ratio 1 : 1.5 such as 100 and 150 |  |
|  |  |  | P1 | for process to find link between volume of R and volume of P eg 1.5² : 1 **or** two values in the ratio 1 : 2.25 such as 100 and 225 | 1.52 (=) is enough for this mark, award P1P1 |
|  |  |  | A1 | for  oe fraction eg  | Accept P = R |
| 13 |  | Proof shown | C2  | for complete argument, eg *n*(*n* – 1) is the product of two consecutive integers and must be even as either *n* or *n* – 1 must be even**or** gives correct reasoning for *n* odd **and** *n* even *n* odd: odd × odd = odd and odd – odd = even *n* even: even × even = even and even – even = even**or** *n* odd: (2*n* + 1)2 – (2*n* + 1) = 4*n*2 + *2n* = 2(2*n*2 + *n*) *n* even: (2*n*)2 – (2*n*) = 4*n*2 – *2n* = 2(2*n*2 – *n*)  |  |
|  |  |  | (C1 | for factorising, eg *n*(*n* – 1) **OR** gives correct reasoning for *n* odd **or** *n* even**OR** gives a partial explanation using *n* odd **and** *n* even,eg odd2 – odd = even and even2 – even = even) |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 14 |  |  | M1 | for × **or**× **or** (÷) ×**OR** tan30 = oe **or** sin60 =  |  |
|  |  |  | A1 | for  or 0.5 |  |
| 15 |  | 48 | M1 | for method to use a volume formula with correct substitution for the cone, sphere or hemisphereeg × *π* × 3² × 10 **or** × *π* × 3³ **or** × *π* × 3³ oe | May work without π or with an approximation of π; must use the correct radius of 3 (and 10) in substitution |
|  |  |  | M1 | for complete method to find total volume eg × *π* × 3² × 10 + × *π* × 3³  |  |
|  |  |  | M1 | (dep first M1) for correct partial simplification, eg 30*π* **or** 18*π*   | Must be cone or hemisphere |
|  |  |  | A1 | caoSC B2 for answer of 264 or 264*π* | Accept 48*π* |
|  |  |  |  |  |  |
| 16 | (a) | 125 | M1 | for method to find the number of 3 digit combinations, eg 53 **or** 53 – 1  |  |
|  |  |  | A1 | for 125 **or** 124 |  |
|  | (b) | 60 | M1 | for method to find the number of combinations with 3 different digits eg 5 × 4 × 3 **or** finds there are 65 combinations that do not have 3 different digits |  |
|  |  |  | A1 | cao |  |
| 17 |  | –1, 2.5 | P1 | for process to form an equation, eg  **or** 2*x*² = 3*x* + 5 |  |
|  |  |  | P1 | for writing in a suitable form ready for solution,eg 2*x*² – 3*x* – 5 (= 0) **or** – 2*x*² + 3*x* + 5 (= 0) |  |
|  |  |  | P1 | (dep 1st P1) for process to solve quadratic equation of form *ax*2 + *bx* + *c* (*=* 0) eg (2*x* – 5)(*x* + 1) (= 0) **or**   |  |
|  |  |  | A1 | for –1, 2.5 oe |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 18 | (a) | 3$\sqrt{3}$ | M1 | for working unambiguously with , eg  **or** **or** |  |
|  |  |  | A1 | cao |  |
|  | (b) | $$\frac{\sqrt{3}}{81}$$ | M1 | for simplifying the power eg $(\sqrt{3})$7 = 27$\sqrt{3}$ |  |
|  |  |  | M1 | for method to rationalise the denominator eg multiplying by  | May be seen as the first step |
|  |  |  | A1 | for **or** equivalent fraction in form , eg  |  |
| 19 | (i) | 3, 8 | M1 | for *a* = 3, may be seen in working or as part of an expression, eg (*x* − 3)² − 9  | 9 does not have to be seen for this mark |
|  |  |  | A1 | for *a* = 3, *b* = 8 |  |
|  | (ii) | 3, –8 | B1 | for 3, –8 **or** ft (i) |  |
|  |  |  |  |  |  |
| 20 |  | *h* =  | P1  | for setting up a proportional relationship between *h* and *p*,eg *h* α**or** *h* = **OR** a proportional relationship between *p* and *t*, eg *p* α $\sqrt{t}$ **or**  *p* = *K*$\sqrt{t}$ | Condone the use of ‘α’ instead of ‘=’ for the first two P marksRelationship may be implied by substitution |
|  |  |  | P1 | for process to substitute at least 2 values, eg 10 =  (*k* = 60) **or** 6 = *K*(*K* = 0.5) |  |
|  |  |  | P1 | for full process leading to *h* = oe **and** *p* = *“*0.5”$\sqrt{t}$ oe  | Both constants must come from a correct process |
|  |  |  | A1 |  *h* =  oe eg *h* = **or** *h* = | Formula for *h* in terms of *t* Does not need to be in simplest form  |
| 21 | (a) |  | M1 | first step to change the subject of *y* = 3*x* – 1 **or** *x* = 3*y* – 1, eg *y* + 1 = 3*x* |  |
|  |  |  | A1 | oe |  |
|  | (b) | Shown | M1 | for method to find fg(*x*), eg fg(*x*) = 3(*x*² + 4) $-$ 1 |  |
|  |  |  | M1 | for method to find gf(*x*), eg gf(*x*) = (3*x* − 1)² + 4 |  |
|  |  |  | M1 | (dep on previous two M marks) for setting up equation, eg 3(*x*² + 4) $-$ 1 = 2[(3*x* – 1)2 + 4] |  |
|  |  |  | M1 | (dep 2nd M1) for correct expansion of (3*x* $-$1)² eg 9*x*2 – 3*x* – 3*x* + 1 |  |
|  |  |  | C1 | for 15*x*² $-$ 12*x* $-$ 1 = 0 from correct working |  |

| **Paper: 1MA1/1H** |
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| **Question** | **Answer** | **Mark** | **Mark scheme** | **Additional guidance**  |
| 22 |  | 12 red, 9 green | P1 | for process to find a relationship between *r* and *g* eg = **or** =  |  |
|  |  |  | P1 | for process to find a second relationship between *r* and *g*eg = **or** = |  |
|  |  |  | P1 | (dep P2) for start to process of solving pair of equations, eg eliminates one variable from the equations **or** removes fractions from both equations |  |
|  |  |  | P1 | (dep P3) for complete process to solve equations to find *g* **or** *r* |  |
|  |  |  | A1 | cao**OR** |  |
|  |  |  | P1 | for two of 3*x* + 3, 4*x* + 2 and 7*x* + 5 |  |
|  |  |  | P1 | for = |  |
|  |  |  | P1 | (dep P2) for removing fractions from the equation, eg 13(3*x* + 3) = 6(7*x* + 5) **or** 39*x* + 39 = 42*x* + 30 |  |
|  |  |  | P1 | (dep P3) for complete process to solve 13(3*x* + 3) = 6(7*x* + 5) |  |
|  |  |  | A1 | cao |  |

**Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 1H**

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: 1MA1/1H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 1(a) |  | Table turned to vertical format. Braille only: Spaces labelled (i) and (ii).Wording added ‘There are two spaces to fill.’ | Standard mark scheme |

| **PAPER: 1MA1/1H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 4 |  | Question changed. Model should be provided.Look at the diagrams for Question 25. You may be provided with a model. Diagram 1 and the model show a solid cylinder. They are not accurate.Look at Diagram 2 below Diagram 1. Diagram 2 shows three options labelled Option A, Option B and Option C on a grid of squares.Each square on the grid represents a one centimetre square.The cylinder is placed with its flat face on a surface.(a) Which of the options, A, B or C, shows the plan of the cylinder? (1 mark)(b) Remember: Each square on the grid represents a one centimetre square.Using Diagram 2, (i) write down the diameter of the cylinder.   (ii) write down the height of the cylinder. (1 mark) | Mark scheme:(a) B1 for Option ACould be indicated on the diagram eg by circling etc. Accept a description eg circle(b) B1 for (i) as 4 **or** (ii) as 3, 4, 5 or 6 |

| **PAPER: 1MA1/1H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 5 |  | Diagram enlarged. Grid cut to make the axes from −7 to 7. Shading changed to dotty shading.Labels removed from inside the shapes. Shapes labelled as ‘shape **A**’ and ‘shape **B**’.Wording added ‘It shows shape **A** and shape **B** on a coordinate grid.’Question changed to:(a) Reflect shape **A** in the x-axis. Label the new shape **X**. (1 mark).(b) Shape **X** can be transformed to shape **B** by a translation $\left(\begin{array}{c}c\\d\end{array}\right)$Find the value of *c* and the value of *d*. (2 marks) | Apply the standard mark scheme but in two stages: (a) B1 for showing the reflected shape **X** (need not be labelled if there is only one shape drawn).(b) B2 for *c* = $-6$ or *d* = $-1$(B1 for one correct value or reverse order) |
| 7 |  | Diagram enlarged.Wording changed to ‘It shows two rectangles, *ABCD* and *PQRS*.’Rectangle *PQRS* moved to lie landscape below *ABCD*.*PQRS* relabelled to follow clockwise vertex labelling convention prescribed in *ABCD*.Wording changed to ‘*PQ* = 10cm’, ‘*AD* = *PS*’.Braille only: rectangles labelled ‘Rectangle 1’ and ‘Rectangle 2’. | Standard mark schemebut note the change in vertex labelling. |
| 10 |  | Diagram enlarged. Graph line made thicker. Intermediates added to the grid at 0.25 intervals.Grid cut to make *x* axis -0.5 to 3 and the *y* axis 0.25 to 0.5 | Standard mark scheme but apply the usual greater tolerances in reading off values. |
| 11 |  | Tables combined. Headings ‘Coach A’ and ‘Coach B’ added. Braille only: spaces labelled (i) to (iii).Part (a) wording added ‘There are three spaces to fill.’ | Standard mark scheme |
| 12 |  | Wording changed to ‘It shows a simplified 2D diagram. There are three spheres, P, Q and R.’Diagram simplified. Braille only: three models provided. | Standard mark scheme |

| **PAPER: 1MA1/1H** |
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| **Question** | **Modification** | **Mark scheme notes** |
| 15 |  | Diagram enlarged and labelled as ‘Diagram 1’.Simplified 2D diagram added and labelled as ‘Diagram 2’.Wording changed to ‘Diagram 1 shows a solid shape.’Wording added: ‘Diagram 2 is a simplified 2D diagram of the solid shape. A hemisphere is half a sphere.’ | Standard mark scheme |
| 16 |  | Diagram enlarged and simplified. | Standard mark scheme |
| 17 |  | MLP only: ‘*x*’ changed to ‘*y*’. Answer will change as *x* is changed to *y*. | Standard mark scheme with *x* changed to *y*. |
| 19 |  | Braille only: ‘*a*’ changed to ‘*r*’ and ‘*b*’ changed to ‘*s*’. | Standard mark scheme with change of letters for Braille. |
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