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

**Mark Scheme (Results)**

Summer 2017

Pearson Edexcel GCSE (9 – 1)

In Mathematics (1MA1)

Higher (Calculator) Paper 2H



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Summer 2017

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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. (e.g. 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 (e.g.. 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.

|  |
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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 |  |  | 98 | P1 | for process to find P(1), eg. 1 – 0.17 – 0.18 – 0.09 – 0.15 – 0.1 (= 0.31) or for a process to find P(1 or 3), eg. 1 – 0.17 – 0.09 – 0.15 – 0.1 (= 0.49) |
|  |  |  |  | P1 | for process to find the number of 3s eg. 0.18 × 200 (=36)or process to find the number of 1s, e.g. P(1) × 200 (= 62),or process to find the number of (1 or 3)s, eg [P(1) + 0.18] × 200or for process to find any expected frequency using any probability × 200 eg. 0.17 × 200  |
|  |  |  |  | A1P1P1A1 | caoORfor process to find P(2 or 4 or 5 or 6), eg. 0.17 + 0.09 + 0.15 + 0.1 (= 0.51)for process to find the number of (2 or 4 or 5 or 6)s, eg. “0.51” × 200 (= 102)cao |

| **Paper: 1MA1/2H** |
| --- |
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 2 |  |  | Yes | P1 | for process to work out the total number of children, e.g. 117 × 4 (= 468) |
|  |  |  | (supported) | P1 | (dep P1) for process to work out total number of adults or the total number of people, e.g. “468” × 5 ÷ 2 (= 1170) or “468” × 7÷ 2 (= 1638) |
|  |  |  |  | A1 | for 1170 or 1638 |
|  |  |  |  | P1C1 | for process to work out the percentage of theatre full,e.g. $\frac{"468"+"1170"}{2600}$× 100 (= 63) or for a process to work out 60% of 2600 (= 1560)for a correct conclusion supported by correct figures e.g. 63% or 1560 **and** 1638OR |
|  |  |  |  | P1 | for a process to work out 60% of 2600, eg. $\frac{60}{100}×2600$ (= 1560) |
|  |  |  |  |  P1A1P1C1 | (dep P1) for process to work out this total number of children, e.g. “1560” × 2 ÷ 7 (= 445(.7…))for 445(.7…)for process to work out children in the circle, eg. “445(.7…)” ÷ 4 (= 111 to 112)for a correct conclusion supported by correct figures e.g. 111 to 112[Where appropriate accept rounded or truncated values] |

| **Paper: 1MA1/2H** |
| --- |
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 2 | cont. |  |  | P1P1A1 | ORfor a process to find the maximum number of children, eg. 2600 × 2 ÷ 7 (= 742(.8…))for process to work out the total number of children, e.g. 117 × 4 (= 468)for 468 and 742(.8…) |
|  |  |  |  | P1 | for $\frac{"468"}{"742(.8..)"}$× 100 (= 63) or process to work out 60% of “742(.8...)” (= 445(.7…)) |
|  |  |  |  | C1 | for a correct conclusion supported by correct figures e.g. 63% or 468 and 445(.7…)[Where appropriate accept rounded or truncated values] |
| 3 |  |  | Side elevationFront elevation | C2 | for the side elevation (4 cm by 2 cm rectangle with a solid line drawn 1 cm from the 2 cm edge, and correct orientation) |
|  |  |  | [C1C2[C1 | for the side elevation as a rectangle]for the front elevation as a trapezium in correct orientation with base 4 cm, parallel sides 1 cm and 4 cmfor the front elevation as a trapezium with two right angles][Ignore incorrect or no labelling] |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 4 | (a) |  | 57.1 | P1P1 | for a process to find time from Liverpool to Manchester, eg. 56 ÷ 70 (= 0.8 (hrs) or 48 (mins))for a process to find total distance, eg. 56 + 61 (= 117) or the total time, eg. “48” + 75 (= 123) or “0.8” + $\frac{75}{60}$ (= 2.05) with consistent units of time |
|  |  |  |  | P1A1 | (dep P2) for a correct process to find average speed with consistent units of time, eg.“117” ÷ “2.05” or “117” ÷ “123” for answer in the range 57 to 57.1 |
|  | (b) |  | explanation | C1 | for explaining that the time taken for the two parts of the journey must be the sameor the distance from Leeds to York is $\frac{3}{4}$ of the distance from Barnsley to Leeds |
| 5 | (a) |  | 3.9 | M1 | for a ratio of  (=1.5) oe or  (=0.66..) oe or $\frac{2.6}{5.4} $ (= 0.48..) oe or $\frac{5.4}{2.6} $ (= 2.07..) oe |
|  |  |  |  | A1 | cao |
|  | (b) |  | 2.05 | M1 | for $\frac{5.4}{8.1}× 6.15$ oe (= 4.1) or $\frac{2.7}{8.1}× 6.15$ oe or ft “scale factor” from (a) |
|  |  |  |  | A1 | cao |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 6 |  |  | Secure Bank (supported) | P1 | for a process to work out the interest after one year e.g. 0.02 × 25000 (=500) or 0.043 × 25000 (=1075) or for 1.02 or 25500 or 1.043 or 26075 |
|  |  |  |  | P1 | for process to find value of the investment after 3 years or the multiplicative factor for 3 years at one of the banks, e.g. 25000 × 1.02 × 1.02 × 1.02 oe (= 26530…) or 1.023 (= 1.0612…) or 25000 × 1.043 × 1.009 ×1.009 oe (= 26546…) or 1.043 × 1.009 ×1.009 (= 1.0618.....)[accept total interest of 1530.. or 1546.. if final values of investment are not found] |
|  |  |  |  | C1 | for Secure Bank from correct figures, eg. 26530.. and 26546.. or 1530… and 1546… or 1.0612... and 1.0618… |
| 7 |  |  | 4.755 ≤ *n* < 4.765 | B2 [B1 | for 4.755 ≤ *n* < 4.765 for 4.755 or 4.765 or 4.764$\dot{9}$] |
| 8 |  |  | 12 | M1 | for evidence of taking a reading from the graph from *h* = 160 |
|  |  |  |  | A1 | for answer in the range 11.8 to 12.2 |
| 9 |  |  | No (supported) | M2[M1C1M2C1 | for the correct position of C or Efor a correct position of B or D]for No with correct supporting evidence, eg. showing C and E in the correct positions ORfor C is a rotation of 90o anticlockwise about *O***or** E is a rotation of 90o clockwise about *O*for No with supporting evidence, eg. C is a rotation of 90o anticlockwise about *O* **and** E is a rotation of 90o clockwise about *O*. |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 10 | (a) |  | Jupiter | B1 | for Jupiter (accept 1.898 × 1027) |
|  | (b) |  | 4.5388 × 1024 | B1 | for 4.5388 × 1024 oe (e.g. 45.388 × 1023) |
|  | (c) |  | Yes (supported) | M1A1 | for (4.35 × 109) ÷ (4.14 × 107) (= 105(.07..)) or (4.14 × 107)× 100 (= 4.14 × 109) or (4.35 × 109) ÷ 100 (= 4.35 × 107) for Yes with correct supporting evidence |
| 11 |  |  |   | M1M1 | for writing at least 2 fractions with a common denominator eg. $\frac{3(3x-2)}{12}, \frac{4(2x+5)}{12}$ , $\frac{2(1-x)}{12}$ with at least one correct numeratoror for $\frac{3x}{4}-\frac{2}{4}-\frac{2x}{3}-\frac{5}{3}=\frac{1}{6}-\frac{x}{6}$ (accept $+\frac{5}{3}$ instead of $-\frac{5}{3}$)(dep) for a method to eliminate all fractions in an equation, ignore errors in any expanded terms eg. $3\left(3x-2\right)-4\left(2x+5\right)=2(1-x)$ or 6×$\left[3\left(3x-2\right)-4\left(2x+5\right)\right]=12×[1-x]$ or $3×3x-3×2-4×2x-4×5=2 ×1-2×x$ OR for the correct expansion of brackets leading to $\frac{9x-6-8x-20}{12}$ = $\frac{2-2x}{12}$  |
|  |  |  |  | M1A1 | (dep on M2) for correctly isolating terms in *x* and number terms of their linear equation e.g. 9*x* – 8*x* + 2*x* = 2 + 6 + 20for  oe  |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 12 | (a) |  | comment | C1 | for comment e.g. incorrect denominator for the 2nd student  or probabilities for 2nd student do not add up to 1 |
|  | (b) |  | No (supported) | C1 | for "no" with supporting evidence, e.g. probabilities should be multiplied togetheror 0.4 × 0.25  |
| 13 |  |  | 7 | P1 | for correct process to find any frequency, eg. “1.1” × 10 (= 11) or “2.8” × 10 (= 28) or “2.3” × 20 (= 46) or “1.4” × 20 (= 28) or “1.4” × 10 (= 14) or “0.7” × 30 (= 21) or for a correct process to find the total area and an area of any block, eg. using 1 cm2 = 1 unit of area to get 53.6 and one of 4.4, 11.2, 18.4, 11.2, 5.6, 8.4  |
|  |  |  |  | P1 | (dep P1) for complete process to find 20% of (“1.4” × 10 + “0.7” × 30), eg. $\frac{20}{100}×"35"$ or $\frac{"5.6"+"8.4"}{"53.6"}×134×\frac{20}{100}$ |
|  |  |  |  | A1 | cao  |
| 14 |  |  | C, F, A, H | B3 | for a fully correct table |
|  |  |  |  | [B2 | for 2 or 3 correct] |
|  |  |  |  | [B1 | for 1 correct] |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 15 |  |  | Proof | C1 | for identifying one pair of equal angles with a correct reason, e.g. (angle) *BAE* = (angle) *CDE*; angles in the same segment are equal or angles at the circumference subtended on the same arc are equalor for identifying two pairs of equal angles with no correct reasons given (angles must be within the appropriate triangles) |
|  |  |  |  | C1 | for identifying a second pair of equal angles with a correct reason, e.g. (angle) *AEB* = (angle) *DEC*; opposite angles or vertically opposite angles are equal or for identifying the three pairs of equal angles with no correct reasons given |
|  |  |  |  | C1 | for stating the three pairs of equal angles of the two trianglese.g. *ABE* = *DCE*, *BEA* = *CED*, *EAB* = *EDC* with fully correct reasons |
| 16 |  |  |  | M1 M1 C1 | for the start of a method to convert 0.22.. to a fraction, eg10*y* = 2.22.. or (*y*=) $\frac{2}{9}$for the start of a method to convert 0.13636... to a fraction, 10*x* = 1.3636.. or 100*x* = 13.6363… or 1000*x* = 136.3636.. or (*x*=)\_ $\frac{13.5}{99}$ or (*x*=) $\frac{135}{990}$for correct arithmetic and concluding the proof |
|  |  |  |  | M1M1C1 | ORfor $0.1\dot{3}\dot{6 }$× $0.\dot{2}$ = $0.\dot{0}\dot{3}$ (= *z*)for complete method to find two appropriate recurring decimals the difference of which is a rational number, eg. 100*z* = 3.0303…,(*z* =) 0.0303… or $\frac{3}{99}$for correct arithmetic and concluding the proof  |

| **Paper: 1MA1/2H** |
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| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 17 |  |  | 66.5 | B1 | for recognising an angle of 60 at *AOB* |
|  |  |  |  | P1 | for a process to find the area of the sector, e.g. $\frac{"60"}{360}×π ×11^{2}$ (= 63.3.. or $\frac{121π}{6}$)  |
|  |  |  |  | P1 | for a process to find the area of the triangle,  e.g. $\frac{1}{2}×7^{2}×\sin("60")$ (=21.2.. or $\frac{49\sqrt{3}}{4}$) |
|  |  |  |  | P1 | for a process to find the required percentage, eg. $\frac{"63.3.."-"21.2.."}{"63.3.."}$ × 100  |
|  |  |  |  | A1 | for answer in the range 66.5 to 66.6 |
| 18 |  |  | 1.45 | P1 | for converting to a common base with at least one correct conversion, eg. (16 =) 24 or (8 =) 23 |
|  |  |  |  | P1 | (dep) for correct use of index laws to derive an equation, eg. $4×\frac{1}{5}+x=3×\frac{3}{4}$ oe |
|  |  |  |  | A1P1A2 | for 1.45 oe (accept 21.45)ORfor a process to find the value of 2x , eg. $8^{\frac{3}{4}}÷16^{\frac{1}{5}}$ = 2.73…for 1.45 oe (accept 21.45) |
|  19 |  |  |  *a* = 4, *b* = –42 |  M1M1M1A1 | for at least two terms from $2\left(x-3\right)\left(x+3\right), \left(x+2\right)\left(x+3\right) , $ $(x-6)(x-3)$(dep) for the correct expansion of at least two expressions, irrespective of signs,eg. $2x^{2}-18, x^{2}+2x+3x+6, x^{2}-6x-3x+18$ oe for $2x^{2}-18- x^{2}-5x-6 - x^{2}+9x-18$ for *a* = 4, *b* = –42 (accept 4*x*  ̶ 42) |

| **Paper: 1MA1/2H** |
| --- |
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| 20 | (a) |  | –0.4 to –0.2 and 3.2 to 3.4 | M1 | for (*y =*) *x* + 4 |
|  |  |  |  | A1 | for answers in the range –0.4 to –0.2 and 3.2 to 3.4 |
|  | (b) |  | 1.6 to 2.5 | M1 | for drawing a tangent to the curve at *x* = 2 |
|  |  |  |  | M1 | for method to find gradient of their tangent |
|  |  |  |  | A1 | for answer in the range 1.6 to 2.5 |
| 21 |  |  | 8600 | P1 | for process to find the length of the rectangle, e.g. 24 × 4 (= 96) |
|  |  |  |  | P1 | for process to find the perpendicular height of an equilateral triangle of side (24 × 2) cm, e.g. 48sin60 (= 41.5(69..)) or $\sqrt{48^{2}- 24^{2}} $ (= $24\sqrt{3} oe)$ |
|  |  |  |  | P1 | for complete process to find the width of rectangle, e.g. “41.5(69..)” + 24 + 24 (= 89.5(69..))  |
|  |  |  |  | A1 | for answer in the range 8592 to 8602 |
| 22 |  |  | 2*n*2 + *n* + 1 | M1 | for a correct start to a method to find *n*th term, eg. equal 2nd differences imply a term in *n*2 or sight of *an*2 + *bn* + *c* |
|  |  |  |  | M1 | for a method leading to 2*n*2 and either *n* or 1  |
|  |  |  |  | A1 | for 2*n*2 + *n* + 1 oe |
| 23 |  |  | $$y=\frac{-3}{\sqrt{7}}x+ \frac{8}{\sqrt{7}}$$ | M1 | for method to find gradient of *OP*, eg $\frac{\sqrt{7}}{2}÷\frac{3}{2}\left(=\frac{\sqrt{7}}{3} or 0.88…\right)$ oe |
|  |  |  |  | M1A1 | (dep) for method to find gradient of tangent, *m*, eg. $\frac{\frac{\sqrt{7}}{2}}{\frac{3}{2}}× m=-1$ $\left(m= \frac{-3}{\sqrt{7}} or-1.13..\right)$for $y-\frac{\sqrt{7}}{2}=\frac{-3}{\sqrt{7}}(x-\frac{3}{2})$ or $y= \frac{-3\sqrt{7}}{7}x+\frac{8\sqrt{7}}{7} oe $or *y* – 1.32.. = ̶ 1.13..(*x* – 1.5)  |

**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** |
| 1 |  | Table turned to vertical format. | Standard mark scheme |
| 3 |  | Alternative question.Model has been provided for all candidates. Diagram enlarged and also provided for MLP.The measurements on the prism have been doubled.Wording added next to the diagram of the trapezium ‘Diagram NOT accurately drawn’.Four shapes have been provided below the trapezium labelled A to D. Wording added above the four shapes ‘scale: 2 cm to 1 metre’. Question wording has changed and has been split into two parts:‘Look at the model or at the diagrams for Question 19 in the Diagram Book. They show a prism with a cross section in the shape of a trapezium. All measurements are in metres. Below the prism there are four shapes A, B, C and D.(i) Which shape shows the front elevation of the prism?(ii) Which shape shows the side elevation of the prism?’ | Mark scheme amended as follows:(i) B2 for C(ii) B2 for A (B1 for B or D) |
| 5 |  | Diagram enlarged. Measurements ‘2.6 cm’ and ‘5.4 cm’ added to the diagram. | Standard mark scheme |
| 8 |  | Grid enlarged. Right axis labelled | Standard mark scheme but allow an answer in the range 11 to 13. |
|  |  |  |  |

| **PAPER: 1MA1\_2H** |
| --- |
| **Question** | **Modification** | **Mark scheme notes** |
| 9 |  | The question has changed and has been split into 3 parts, (a), (b) and (c). There is a separate grid with different triangles on each grid:  (a) Triangles A and B have been drawn on the grid.  (b) Triangles B and C have been drawn on the grid. (c) Triangles A, B, C and D have been drawn on the grid. The questions for each part now is:(a) It shows triangle A and triangle B given on a grid. Describe the single transformation that maps triangle A onto triangle B.(b) It shows triangle B and triangle C given on a grid. Describe the single transformation that maps triangle B onto triangle C.(c) It shows triangles A, B, C and D given on a grid. Amy reflects triangle A in the line *y* = *x* to get triangle DShe is then going to reflect triangle D in the *x*–axis to get triangle EAmy says that triangle E should be in the same place as triangle C. Is Amy correct? You must show how you get your answer. There is a cut out shape available for you to use | The mark scheme for this amended question is as follows:(a) B1 for “reflection in the *x*-axis”(b) B1 for “reflection in the line *y* = *x*”(c) Standard mark scheme:for No with correct supporting evidence eg showing C and E in the correct positions or stating C is a reflection in the *y*-axis rather than the *x*-axis |
| 10 |  | Rows ‘Mars’ and ‘Saturn’ removed. Wording ‘eight’ changed to ‘six’ | Standard mark scheme. |
| 11 |  | MLP only: *x* changed to *y*. | Standard mark scheme but *x* changed to *y*. |
| 12 |  | Diagram enlarged. Wording added ‘It shows a probability tree diagram.’Wording added ‘Mr Lear drew a probability tree diagram to show the information | Standard mark scheme. |
| 13 |  | Diagram enlarged. Right axis has been labelled. Lines on the histogram moved.50-60 moved to 2.0; 60-90 moved to 0.5 | Standard mark scheme. |
| 14 |  | Diagram enlarged.Wording added ‘There are four spaces to fill.’ Graphs labelled ‘Graph A, Graph B, Graph C’ etc. | Standard mark scheme. |
| 15 |  | Diagram enlarged. | Standard mark scheme. |
| 17 |  | Diagram enlarged. Shading changed to dotty shading. | Standard mark scheme. |
| 19 |  | MLP only: *x* changed to *y*. | Standard mark scheme but *x* changed to *y*. |
| 20 |  | Diagram enlarged. | Standard mark scheme. |
| 21 |  | Diagram enlarged. | Standard mark scheme. |
| 9 |  | (a) (b)(c) |  |

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