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



**Mark Scheme (Results)**

Summer 2018

Pearson Edexcel International GCSE

In Mathematics A (4MA1) Paper 1HR

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**General Marking Guidance**

* All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
* Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
* Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
* There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
* All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.

Examiners should also be prepared to award zero marks if the candidate’s response is not worthy of credit according to the mark scheme.

* Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
* When examiners are in doubt regarding the application of the mark scheme to a candidate’s response, the team leader must be consulted.
* Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
* **Types of mark**
	+ M marks: method marks
	+ A marks: accuracy marks
	+ B marks: unconditional accuracy marks (independent of M marks)
* **Abbreviations**
	+ cao – correct answer only
	+ ft – follow through
	+ isw – ignore subsequent working
	+ SC - special case
	+ oe – or equivalent (and appropriate)
	+ dep – dependent
	+ indep – independent
	+ eeoo – each error or omission
* **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

* **With working**

If there is a wrong 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.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

* **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: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

* **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part ofthe question CANNOT be awarded in another.

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| **International GCSE Maths 4MA1 1HR** |
| --- |
|  |
| Q | **Working** | **Answer** | **Mark** | **Notes** |
| 1 |  | 20 × 14 (= 280) | 460 | 4 | M1 |  |
|  |  | (= 180) |  |  | M1 |  |
|  |  | “280” + “180” |  |  | M1 | (dep) on at least one of the previous M marks |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |
|  |  | **Alternative scheme 1** |  |  |  |  |
|  |  | (24 +14)÷2 (= 19) **and**  (20−16)÷2 (=2) | 460 | 4 | M1 |  |
|  |  | 2 × 19 (= 38) **and** 16 × 24 (= 384)  |  |  | M1 |  |
|  |  | “38” + “38” + “384” |  |  | M1 | (dep) on at least one of the previous M marks |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |
|  |  | **Alternative scheme 2** |  |  |  |  |
|  |  | 20 × 24 (= 480) | 460 | 4 | M1 |  |
|  |  | (20−16)÷2 (=2) **and** 24 − 14 (= 10)2 × 10 = 20 |  |  | M1 |  |
|  |  | “480” – “20” |  |  | M1 | (dep) on at least one of the previous M marks |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 2 |  | 1 × 5 + 3 × 9 + 5 × 24 + 7 × 40 + 9 × 7 (= 495)**or**5 + 27 + 120 + 280 + 63 (= 495) | 5.8 | 4 | M2 | for at least 4 correct products added (need not be evaluated)If not M2 then awardM1 for consistent use of value within interval (including end points) for at least 4 products which must be added **OR**correct mid-points **used** for at least 4 products and not added  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | “495” ÷ 85 |  |  | M1 | dep on at least M1Allow division by their  provided addition or total under column seen |
|  |  |  |  |  | A1 | for 5.8 − 5.824 |
|  |  |  |  |  |  | **Total 4 marks** |

| 3 | (a) |  | Correct **R**(5,6), (3,6), (3,5) | 2 | B2 | fully correctIf not B2 then B1 for correct orientation of **R** but in wrong position |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Correct **T**(2,−1), (2,−3), (1,−3) | 1 | B1  |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 4 |  | 675 ÷ (5 + 4) × 5 (= 375) | 225 | 3 | M1 |  | M2 675 ÷ (5 + 4) × 3 |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | “375” ÷ 5 × 3 |  |  | M1 | dep M1 |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 5 |  | For example,

|  |  |
| --- | --- |
| *n* | *E* |
| 1 | 7 |
| 2 | 11 |
| 3 | 17 |
| 4 | 25 |
| 5 | 35 |

 | No + reason | 2 | M1 | for evaluating *E* correctly for any value of *n* |
|  |  |  |  |  | A1 | for No with *E* evaluated correctly as a non-prime number |
|  |  |  |  |  |  | **Total 2 marks** |

| 6 |  | Angle *EBG* = 180 – 2 × 65 (= 50) or Angle *ABE* = 180 − (38 + 65) (= 77) | 27 | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Angle *ABE* = 180 − (38 + 65) (= 77) **and**Angle *ABG* = “77” – “50” |  |  | M1 | for a complete method to find angle *ABG* |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |
|  |  | **Alternative scheme 1** |  |  |  |  |
|  |  | Angle *EBG* = 180 – 2 × 65 (= 50) orAngle *EBC* = 103 | 27 | 3 | M1 |  |
|  |  | Angle *EBC* = 103 **and** Angle *ABG* = 180 – (103 + ”50”) |  |  | M1 | for a complete method to find angle *ABG* |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 7 | (a) |  | 4*n* + 2 | 2 | M1 | for 4*n* + *k* (*k* may be 0 or absent) oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | A1 | oe e.g 6 + (*n* − 1)4 |
|  | (b) |  | 4*n* + 6 | 1 | B1 | oe ft part (a) providing M1 in part (a) is awardede.g 4 (*n* + 1) + 2 |
|  |  |  |  |  |  | **Total 3 marks** |

| 8 | (a) |  | 1.39 × 106 | 1 | B1  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 5 × 10−3 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 9 |  | 2.5 − 0.6 = 1.9 | 2 hours 51 minutes | 4 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 3 × 12 × “1.9” (= 68.4) |  |  | M1 | for using length × width × height to find a volume |
|  |  | “68.4” × 1000 ÷ 400 (= 171 minutes) |  |  | M1 | for their volume × 1000 ÷ 400 |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | 250 − 60 = 190 | 2 hours 51 minutes | 4 | M1 |  |
|  |  | 300 × 1200 × “190” (= 6.84 × 107) |  |  | M1 | for using length × width × height to find a volume |
|  |  | “6.84 × 107” ÷ 106 × 1000 ÷ 400 (= 171 minutes) |  |  | M1 | for their volume ÷ 106 × 1000 ÷ 400 |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 10 |  | 16*x* = 32 or 32*y* = 144 | (2, 4.5) | 3 | M1 | for a correct sequence of operations which leads to 1 equation in one unknown, allowing one arithmetical error |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 3 × '2' + 2*y* = 15 or 3*x* +2 × '4.5' = 15 |  |  | M1 | (dep) substitute found value of one variable in one equation |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 11 |  | 72 × 1000 (= 72000) or 72 ÷ 60 (= 1.2) or 72 ÷ 60 ÷ 60 (= 0.02) or 60 ÷ 60 × 1000 (= 3.6) | 20 | 3 | M1 | forat least **one**  of × 1000 or ÷ 60  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1  | (dep) for a complete method |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 12 | (a) | 6×25 + 6×45 (= 150 + 270 = 420) | 20 | 4 | M1 | for 6×25 (=150) or 6×45 (=270) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | “150” + “270” – 350 (= 70) or “420” – 350  |  |  | M1 |  |
|  |  | $\frac{"70"}{350}$ × 100 |  |  | M1 | (dep on M2) |
|  |  |  |  |  | A1 |  |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | 6×25 + 6×45 (= 150 + 270 = 420) | 20 | 4 | M1 | for 6×25 (=150) or 6×45 (=270) |
|  |  | $\frac{"420"}{350}$ × 100 = 120 |  |  | M1 |  |
|  |  | “120” – 100  |  |  | M1 | (dep on M2) |
|  |  |  |  |  | A1 |  |
|  | (b) | 500 000 ÷ 8 (=62 500) | 6 250 000 | 3 | M1 |  |
|  |  | 500 000  |  |  | M1  | for a complete method |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |

| 13 |  | $\frac{1}{3}+\frac{1}{5}$ (= $\frac{8}{15}$) or 0.53... or 53.3.....% or 53% | 900 | 4 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 1− $"\frac{8}{15}"$ (= $\frac{7}{15}$) or 0.46..... or 0.47 or 46.6...% or 47% |  |  | M1 |  |
|  |  | 420 ÷ $"\frac{7}{15}"$ (= 900) oe |  |  | M1 |  |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 14 | (a) |  | 8*e*6 *f* 9 | 2 | B2B1 | for 2 correct terms in a product of 3 terms |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |  | 2 | M1 | M1 for 3 correct terms out of 4 **or** for 4 correct terms ignoring signs **or** for  for any non zero value of *c* **or** for *d* +  for any non zero value of *d* |
|  |  |  |  |  | A1 |  |
|  | (c) |  or or  |  | 2 | M1 | for one correct step |
|  |  |  |  |  | A1  | oe |
|  | (d) |  |  | 2 | M1 | for (2*n* – 1)(2*n* + 1) |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 8 marks** |

| 15 | (a) |  | on first red branch | 3 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Correct binary structure |  | B1 |  |
|  |  | $\frac{9}{20}$ , $\frac{7}{16}$ , $\frac{9}{20}$ , $\frac{7}{16}$  | Labels and correct probabilities on all second branches |  | B1 |  |
|  | (b) |  | or 0.196(875) | 2 | M1 |  |
|  |  |  |  |  | A1 | oe ft diagram Accept 0.20 or better |
|  | (c) | + | or 0.506(25) | 3 | M1 | for  |
|  |  |  |  |  | M1 | for + |
|  |  |  |  |  | A1 | oe Accept 0.51 or better |
|  |  |  |  |  |  | **Total 8 marks** |

| 16 | (a) |  | Shown | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 | for at least one correct expression |
|  |  |  |  |  | A1 | for completion |
|  | (b) |  or $\frac{8\pm \sqrt{8^{2}-4×1×(-144)}}{2}$ or $\frac{8\pm \sqrt{-8^{2}-4×1×(-144)}}{2}$ | 20.6 | 4 | M1 | M1 for correctly substituting into the quadratic formulacondone one sign error in substitution; allow partial correct evaluation |
|  |  |  **or** **or**  NB denominator must be 2×1 or 2 **and** there must be evidence for correct order of operations in the numeratorAllow + instead of ± in the formula |  |  | M1 | If the first M1 is awarded and an answer of 16.6.... or $4+4\sqrt{10}$ seen award this M mark |
|  |  |  |  |  | A1 |  (dep on M1) 16.6…. |
|  |  |  |  |  | B1 | (dep on M1) 20.6 - 20.65 ft |
|  |  |  |  |  |  | **Total 7 marks** |

| 17 |  | FDs are 2, 3, 2.8, 0.7, 0.8 | Correct histogram | 3 | M1 | for any two correct FD calculations (can be implied by at least two correct bars) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 | for any three correct FDs (can be implied by at least three correct bars ) |
|  |  |  |  |  | A1 | fully correct histogram |
|  |  |  |  |  | (SC: B2 for all five bars of correct width with heights in the correct ratio) |
|  |  |  |  |  | (SC:B1 for three bars of correct width with heights in the correct ratio) |
|  |  |  |  |  | **Total 3 marks** |

| 21 | (a) | or  |  | 1 | B1 | for correct expansion of a pair of brackets and then  written down |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | (One of the numbers) is even **or** multiple of 2 **or** 2 is a factor | Proof | 3 | M1 |  |
|  |  | (One of the numbers) is a multiple of 3 **or** 3 is a factor |  |  | M1 |  |
|  |  | Hence a multiple of 6 |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 22 |  | or$\frac{4}{3}×π×\left(1.2+t\right)^{3}-\frac{4}{3}×π×1.2^{3}$  | 3.9 | 5 | M1 | for an expression for the volume of the inner sphere |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |   |  |  | M1 |  |
|  |  |  = 7.238229474 + 0.7333333 = 7.97(1562807) |  |  | M1 | for a correct expression **or** sight of 7.23(8229474) **+** 0.73(33333)**or** sight of 7.97(1562807) |
|  |  |  =1.2392…1.2392 − 1.2 = 0.0392 |  |  | M1 | for a correct expression **or** sight of $\sqrt[3]{1.90(3070437)}$**or** sight of 1.23(9229151)**or** sight of 0.0392(29151) |
|  |  |  |  |  | A1 | for 3.9 – 3.92 |
|  |  |  |  |  |  | **Total 5 marks** |

| 23 |  | (First term = 3 and last term = 999) or*a* = 3 and *d* = 3 | 166 833 | 4 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 999 ÷ 3 (= 333) |  |  | M1 | for finding the number of termsAllow 1000÷3 = 333.3 = 333 |
|  |  | Sum =  or Sum =  |  |  | M1 | for using a correct method to find the sum |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

**3**

1

2

3

4

5

6

7

8

9

10

-1

-2

-3

-4

-5

1

2

3

4

5

6

7

8

9

10

-1

-2

-3

-4

-5

0

*x*

*y*

S

R

T

**15**

**bag X**

**bag Y**

Blue

Red





Blue

Blue

Red

Red









**17**

1

2

3

4

5

50

100

150

200

250

300

350

Frequency

density

Area (hectares)

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