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

Mark Scheme (Results)

Summer 2023

Pearson Edexcel International GCSE

In Mathematics A (4MA1) Paper 2F

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Summer 2023

Question Paper Log Number P72826A

Publications Code 4MA1\_2F\_2306\_MS

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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
	+ awrt – answer which rounds to
	+ 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.

If a candidate misreads a number from the question. E.g. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review. If there is a choice of methods shown, mark the method that leads to the answer on the answer line; where no answer is given on the answer line, award the lowest mark from the methods shown.

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

* **Parts of question**

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

Brackets and speech marks:

0.32 × 200 (= 64) the brackets here mean that the calculation is required for the mark and not the answer – however the answer would also secure the mark. If a student gave
0.32 × 200 = 68 they would still gain the mark as the method is correct and does not require the calculation to be correct for the award of the mark.

64 alone would also gain the mark.

200 – “146”

This shows that the calculation requires 200 minus the calculation that gave 146; if the calculation was shown but inaccurately worked out then the method mark would still be gained.

Eg 146 should have come from 0.73 × 200

If the student had given 0.73 × 200 = 156 and then given 200 – 156 this would have gained the method mark…. the 156 came from a correct calculation even though the arithmetic was incorrect.

| **international GCSE Maths**  |
| --- |
| **Apart from Question 17 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method** |
| **Q** | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (a) |  | 7054 | 1 | B1 |  |
|  | (b) |  | 78 300 | 1 | B1 |  |
|  | (c) |  | 70 000 | 1 | B1  | or seventy thousand oe or tens of thousands or 10 000 (the place value of the 7) |
|  | (d) |  | 2000 | 1 | B1 | 2,000 accept 2000 seen elsewhere if box is empty |
|  | (e) |  | 10 000 | 1 | B1 | 104 |
|  |  |  |  |  |  | **Total 5 marks** |

| **2** | (a) |  | 60 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 9 | 1 | B1 |  |
|  | (c) |  | 21 | 1 | B1 | Sometimes continental 1 looks like 7…please accept as no 27 on list |
|  | (d) |  | 15 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| **3** | (a) |  | 28 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |  | 1 | B1 | (quarter circle can be any quadrant) |
|  | (c) | “28” + 10 + 14 + 20 + “18” (= 90) oe eg8 × 11.25 (= 90)or“56” + 20 + 28 + 40 + “36” (= 180) oe |  | 2 | M1 | ft their (a) and their (b) from diag3 correct figures out of 5 seen (no need to add)allow figures doubled; 3 out of 5 seen (figures may be seen in or by table)  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 180 | A1 | caoSCB1 if no other marks awarded for 360 or 90 |
|  |  |  |  |  |  | **Total 4 marks** |

| **4** | (a) |  | Table  Description automatically generated | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 17, 21 | 1 | B1 | Ignore any extra numbers if the 2 that are required are there |
|  | (c) |  | 41 | 1 | B1 |  |
|  | (d) |  | A correct reason | 1 | B1 | The numbers of sticks are always an odd number (always ends in 1,3,5,7,9) 102 is even, pattern 25 has 101 sticks, The pattern goes …97, 101, 105…It is 4*n* + 1 oe4 × 25 + 1 = 101 (or does not =102)The pattern never ends in a 2 |
|  |  |  |  |  |  | **Total 4 marks** |

| **5** | (a) |  | (2, 3) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | For the point (6, 1) marked | 1 | B1 | If not marked *D* then award marks so long as unambiguous. |
|  | (c) |   | (3.5, 1) | 2 | B2 | oe for both coordinates correct |
|  |  |  |  |  | (B1 for a correct calculation for one coordinate  or  or for one correct coordinate or for (1, 3.5)) |
|  | (d) |  | line drawn | 1 | B1 | horizontal line drawn – any length as long as unambiguous |
|  |  |  |  |  |  | **Total 5 marks** |

| **6** | (a) |  | Octagon | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 8.6 | 1 | B1 | allow in range 8.4 – 8.8 |
|  | (c) |  | B, D | 1 | B1 | both given |
|  |  |  |  |  |  | **Total 3 marks** |

| **7** | (i) |  | unlikely | 1 | B1 | Award unlikely together with a fraction. Accept incorrect spelling if meaning is clear |
| --- | --- | --- | --- | --- | --- | --- |
|  | (ii) |  | evens | 1 | B1 |  |
|  | (iii) |  | impossible | 1 | B1 |  |
|  |  |  |  |  | **Total 3 marks** |

| **8** | 26 × 14 (= 364) **or** 26 × 15 (= 390) **or** 14 × 15 (= 210) **or** oe |  | 3 | M1  | For multiplying 2 of the 4 numbers 26, 14, 15, oe |
| --- | --- | --- | --- | --- | --- |
|  | **3 of** 26, 14, 15,  oe **seen** multiplied together |  |  | M1 | For multiplying 3 of the 4 numbers (multiplication must be **seen**) – could be done in separate sums  |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 4095 |  | A1 |  |
|  |  |  |  |  | **Total 3 marks** |

| **9** |  |  | Correct triangle | 2 | B2 | Correct triangle within toleranceIf not B2, then B1 for *CB* of length 6.5 cmor angle *ACB* = 38°Allow *CB* length 6.3 cm to 6.7 cm and angle *ACB* = 36° to 40° |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

| **10** | (a) | 6 × 2.2(0) (= 13.2(0)) oe |  | 2 | M1 | May be continued addition |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 6.8(0)  | A1 |  |
|  | (b) | 50 ÷ 0.85 (= 58.82…) or58 × 0.85 (= 49.3(0)) |  | 2 | M1 | Allow continued addition if clearly adding at least 58 lots of 0.85 (allow one arithmetic error) |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 58 | A1 | SCB1 if no other marks scored for 59 or 58.8… |
|  |  |  |  |  |  | **Total 4 marks** |

| **11** | (a) | oe  |  | 2 | M1 | Allow 0.61… × 360 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 220 | A1 | Accept 219.6 - 220 |
|  | (b) |  or 5 : 1 or or 1 : 5or or 5 : 13or or 13 : 5 |  | 2 | M1 | starting to work with 195° and 39 people or starting to work with 195° and 75°  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 15 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| **12** |  |  oe |  | 2 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 53.4 | A1 | allow answers in range 53.3 – 53.43 |
|  |  |  |  |  |  | **Total 2 marks** |

| **13** | (a) |  |  | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |  | 2 | B2 | If not B2, thenB1 for  or or 6(expression with one error) |
|  (c) |  |  | 3 | B3 | for  oe eg *T* = 4(2*h* + 5*j*) oe[accept *T* = 8 × *h* + 20 × *j*] (B2 for 8*h* + 20*j* or *T* = 8*h* + *aj* or *T* = *bh* + 20*j* or *T* = 20*h* + 8*j* or a correct equation with letters such as *S* and *L* eg *T* = 8*S* + 20*L*)(B1 for 8*h* + *aj* or *bh* + 20*j* or 20*h* + 8*j* or for *T* = an incorrect expression in *h* and *j*) |
|  |  |  |  |  |  | **Total 6 marks** |

| **14** | (a) |  | 612 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 2580 ÷ 6.45 (= 400) **or** 2580 × 0.85 (= 2193) **or** **or**  |  | 2 | M1 |  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 340 |  | A1 | cao |
|  |  |  |  |  |  | **Total 3 marks** |

| **15** | (a) |  | Valid Reason | 1 | B1 | eg Finn added 5 and 3, but he should have squared the 3 first. |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 2 × 6 ‒ (4² ‒ 14) | 1 | B1 | Brackets in correct location.Condone correct but unnecessary brackets.[must not be around the minus sign between the 6 and the 4²] |
|  | (c) |  **or**……+ 10**or** **or** ‒3 × ‒3 + 5 × 2 |  | 2 | M1 | For either 9 or 10 in the correct place or the correct substitutions (brackets around –3 squared, unless recovered )  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 19 |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| **16** | (a) |  | 104 | 1 | B1 | accept 102 – 106 |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | eg “9.4” × 50 (= 470) [460 – 480]**or**eg “9.4” ÷ 2 (= 4.7) [4.6 – 4.8] |  | 3 | M1 | **Their** measurement × 50 or ÷2Working may be shown by diagram |
|  |  | “9.4” × 50 ÷ 2 |  | M1 | **Their** measurement × 50 and ÷2Working may be shown by diagram |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 235 | A1 | accept 230 – 240 |
|  |  |  |  |  |  | **Total 4 marks** |

| **17** |  | eg  **and**  |  | 3 | M1 | both fractions expressed as improper fractions, no need for ÷ or × may be equivalent to those given eg  or  etc. A student could invert  and go straight to the 2nd M1, this mark is then implied. |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  oe **or**  |  | M1 | For inverting 2nd fraction and showing intention to multiply **or** for both fractions expressed as correct equivalent fractions with the same denominator with intention to divide eg  |
|  |  | eg **or** **or** **or** **or** correct working to  **and** writing(may be earlier in working)*working required* | Shown | A1 | Dep on M2 for conclusion to  from correct working – either sight of the result of the multiplication or division e.g.  must be seen or correct cancelling prior to the multiplication to  **OR**writing  (maybe on first line of working) and correct working as far as LHS =**NB: marks are awarded for use of fractions not decimals (but allow a decimal check of answer)** |
|  |  |  |  |  |  | **Total 3 marks** |

| **18** |  |  oe eg 1 – 0.73 (= 0.27) or0.32 × 200 (= 64) or 0.13 × 200 (= 26) or 0.28 × 200 (= 56) or 0.73 × 200 ( = 146) |  | 3 | M1 | (0.27 may be seen in table)[could work with percentages eg 100 – 32 – 13 – 28 (=27)] |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | [1 – “0.73”] × 200 oe eg“0.27” × 200 or200 – “64” – “26” – “56” or200 – “146”  |  | M1 | for a complete method or for an answer of  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 54 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| **19** | (4*x* – 27) + (3*x* + 46) = 180 oe or“expression for C” + (3*x* + 10) = 180**or** **or** 3*x* + 46 + 4*x* – 27 + 3*x* + 10 + [“180 – (3*x* + 10)” ]= 360 |  | 4 | M1 | Sum angles *A* and *B* to 180,or find an expression for *BCD* and sum all angles to 360.[condone missing brackets and condone use of any letter for angle *C* (even *x* or *BCD*)] |
| --- | --- | --- | --- | --- | --- |
|  |  |  | A1 | *x* = 23 |
|  | eg 3 ×”23” + 46 (= 115)**or**eg 180 – (3 ×”23” + 10) (= 101)  |  | M1ft | dep on M1 using **their *x*** to calculate a value for angle *B* or *C* (cannot be a negative value and cannot just be *x*) |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 115  | A1 | Allow 3*x* + 46 or *ABC* if 115 is clearly seen in working or on diagram |
|  |  |  |  |  | **Total 4 marks** |

| **20** | (a) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | −3 | −2 | −1 | 0 | 1 | 2 | 3 |
| *y* | **8** | 2 | **−2** | **−4** | −4 | **−2** | **2** |

 | 2 | B2 | for all correct values, otherwiseB1 for 3 or 4 correct values |
|  |  |
|  | (b) |  |  | 2 | M1 | dep on B1 scored in (a)for at least 5 points plotted correctly (ft their table)  |
|  |  |  | correct curve |  | A1 | for a fully correct curve (all coordinates correct and correctly plotted and joined with a curve and curved between (0, ‒4) and (1, ‒4)) |
|  |  |  |  |  |  | **Total 4 marks** |

| **21** | 2 and 15 seen or 1 × 2 (+) 3 × 5 (= 17) | 2*x* + 15*x* (= 85) or or0.25*t* × 2 + 0.75*t* × 5 (= 85) |  | 4 | M1 | For 2 and 15 oe seen or 17 or a correct equation in one unknown fornumber of 2p coins (*x*) ornumber of 5p coins (*y*) ortotal number of coins (*t*) |
| --- | --- | --- | --- | --- | --- | --- |
|  | 85 ÷ (2 + 15) ( = 5)or at least two pairs of multiples of the values of 2 and 15 (eg 4, 30; 6, 45…..) or10(p) (and) 75(p) or 10 : 75 or5 × 2 and 15 × 5 2 × 5 + 5 × 3 × 5 or20 coins  | 17*x* = 85 (*x* = 5) or (*y* = 15) or4.25*t* = 85 (*t* = 20) |  | M1 | assumes previous M1 for number of 2p coins **or** number of 5p coins **or**total number of coins **or**value of 2p coins **and** value of 5p coinsmay be **clearly** listed eg2 5552 5552 5552 5552 555with no ambiguity |
|  | 5 (2p coins) and 15 (5p coins) or5 : 15 (if clearly identified (or used) as the key ratio eg not just part of a list) or(3 – 1) × 5  | eg 15 – 5 oe |  | M1 | Correct number of 2p coins **and** 5p coins or a sum to find the difference in number of coins |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 10 | A1 | SCB1 if no other marks awarded for 21.25 in working or on answer line |
|  |  |  |  |  | **Total 4 marks** |

| **22** | (a) |  |  | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 0.000 54 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| **23** | *DCO* = 90 (or right (angle)) or *DAO* = 90 (or right (angle))Could also be awarded for *CAO* + *CAD* = 90 or*DAC* + *CAO* = 90 |  | 3 | M1 | may be marked on diagram – also allow right angle ’square’ symbol on diagram | M2 implied by 360 – 90 – 90 – 48 **or** 360 – 228 |
| --- | --- | --- | --- | --- | --- | --- |
|  | Obtuse *AOC* = 360 ‒ 90 ‒ 90 ‒ 48 (= 132)oe**or** Obtuse *AOC* = 2(180 – (0.5 × 48) – 90) (= 132)**or**Obtuse *AOC* = 180 – “24” – “24” or 180 – 48(if working with )**or**Reflex *AOC* = 90 + 90 + 48 |  |  | M1 | **dep on M1** being awardedmay be marked on diagram  |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 228 |  | A1 | SC if no other marks awarded 132 gains B1 |
|  |  |  |  |  | **Total 3 marks** |

| **24** | for 0.04 × 680 oe **( =** 27.2) **or** 1.04 × 680 oe **( =** 707.2) |  | 3 | M1 | For finding 4% or 104% of the value | **or** M2 for 680 × 1.04³ **or** 680× 1.044 **or** 795.5(0…..) |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1.04 × “707.2” (= 735.488) oe **and**1.04 × “735.488” (= 764.90752) oe**or**0.04 ×(680 + “27.2”) = 0.04 ×”707.2” = 28.288 **and**0.04 ×”(707.2 +28.288 )”= 0.04 ×”735.488” = 29.41952 **and**“735.488” + “29.41952” (= 764.90752….) |  | M1 | for completing the method |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 765 | A1 | or 764 – 765(if a correct answer is seen in working and then rounded incorrectly, award full marks)**SC:** if no other marks gained award M1 for 1.12 × 680 oe **or** 761.6(0) (or 762) **or** 0.12× 680 oe **or** 81.6(0) (or 82) **or** 0.963 × 680 oe **or** 601.62… (or 602)(accept (1 + 0.04) as equivalent to 1.04 throughout but not (1 + 4%)) |
|  |  |  |  |  | **Total 3 marks** |

| **25** |  | For 27 ×1000 (= 27 000) **or** **or****or**sight of 450 |  | 3 | M1 | For one of ×1000 (eg sight of 27 000) or (÷60 ÷60) or ÷3600 oeie correct conversion of distance units or of time units or  | M2 for 27 ÷ 3.6**or** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  oe (0.45 ×1000) ÷ 60 **or**0.27…. × 27 |  |  | M1 | For a fully correct method with correct use of brackets eg 27 000 ÷ 60 × 60 is M1 only if not recovered |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 7.5 |  | A1 |  or  oe |
|  |  |  |  |  |  | **Total 3 marks** |

| **26** | 17 × 11 (= 187) **or** 18.5 × 12 ( =222) **or** 18 × 9 (=162) **or** 18.5 × 10 (= 185)  |  | 4 | M1 | Expression for total of **A** or **B** either including or excluding last round | M2 for 1.5 × 11 + 18.5 (= 35) **or** 9 × 0.5 + 18.5 (= 23) OR1.5 × 11 (= 16.5) **or**0.5 × 9 (= 4.5) |
| --- | --- | --- | --- | --- | --- | --- |
|  | 18.5 × 12 − 17 × 11 (“222” – “187”)(= 35) **or** 18.5 × 10 − 18 × 9 (“185” – “162” )(= 23) **or** (*x* = 35) **or** (*y* = 23) **or**Diff between **A** and **B** in first rounds “187” – “162” (= 25) **or**Diff between **A** and **B** after further round “222” – “185” (= 37)[or 2 ×18.5 (= 37) where 2 must come from correct working] |  | M1 | expression for number of points gained by **A** or **B** in the last round or for an equation that could lead to the number of points gained by **A** or **B** in the last round |
|  | “35” – “23” or“37” – “25” or“16.5” – “4.5” |  | M1 | calculation for difference between number of points scored in last round |
|  | *Correct answer scores full marks (unless from obvious incorrect working)* | 12 | A1 |  |
|  |  |  |  |  | **Total 4 marks** |

The 2 is 2 further rounds of 18.5 ie 37 comes from 18.5 ×12 – 18.5 × 10 so the 2 × 18.5 is (12 – 10)×18.5

| **27** |  | eg (*DEK* =)  **or** 40**or (**interior angle =)  **or** 140**or** *OFK* = 140 ÷ 2 (= 70)**or** *FOK* = (= 80)**or***EDK* = 180 – 0.5 × 140 (=110)Angles marked correctly (any exterior or interior angle) gains this mark |  | 3 | M1 | method to find interior or exterior angle or correct interior or exterior angle stated or shown correctly on diagram or for using 70° for *OFK* or 80° for *FOK* or 110 for *EDK*If a student has only found an interior or exterior angle and has clearly mixed up interior and exterior angles this mark cannot be awarded but can still be awarded for any of the other angles stated |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *EDK* = 110 and *DEK* = 40 or*FOK* = 80 and *OFK* = 70 or*ODE* = 70 and *DEK* = 40 or*FED* = 140 and *EDK* = 110 oe |  | M1 | For two correct angles that can lead directly to the answer in a single step (eg 180 – both angles or one angle minus the other) |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 30 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| **28** |  |  **or** **or  or**(*BD* =)  |  | 4 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  (= 55.1(5…)**) or**  (= 55.1(5…)) **or**(= 55.1(5…)) **or** **or***CAD* = 180 – 38 – – 90 (= 180 – 38 – 34.8 – 90 = 17.2) |  | M1 | (accept 55.1 or 55.2 without working) |
|  |  |  oe eg  oe or  oe |  | M1 | A correct equation with *CD* being the only unknown value |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 2.47 | A1  | 2.44 – 2.48 |
|  |  |  |  |  |  | **Total 4 marks** |

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