**IGCSE (9–1) Maths - practice paper 4F mark scheme**

**Results Plus data on 92 of the 100 marks:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paper 4** |  |  |  |  | **Edexcel averages:** |
| **Year** | **Paper** | **Qu. no** | **New qu. no.** | **Mean score** | **Max score** | **Mean %** |  | **ALL** | **A\*** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **U** |
| 1701 | 2F | Q01cd | Q01 | 2.73 | 4 | 68.3 |  | 2.73 |  |  |  | 3.24 | 3.00 | 2.53 | 2.08 | 1.52 | 0.84 |
| 1701 | 2F | Q03 | Q02 | 2.71 | 5 | 54.2 |  | 2.71 |  |  |  | 3.12 | 2.80 | 2.57 | 2.28 | 1.92 | 1.40 |
| 1701 | 2F | Q05 | Q03 | 3.29 | 4 | 82.3 |  | 3.29 |  |  |  | 3.85 | 3.65 | 3.35 | 2.43 | 1.42 | 0.90 |
| 1701 | 2F | Q06 | Q04 | 4.91 | 7 | 70.1 |  | 4.91 |  |  |  | 5.86 | 4.97 | 4.59 | 4.03 | 3.53 | 2.04 |
| 1701 | 2F | Q07 | Q05 | 3.00 | 4 | 75.0 |  | 3.00 |  |  |  | 3.71 | 3.35 | 2.86 | 2.12 | 1.05 | 0.64 |
| 1701 | 2F | Q08 | Q06 | 4.76 | 7 | 68.0 |  | 4.76 |  |  |  | 5.75 | 4.93 | 4.40 | 3.76 | 3.01 | 2.14 |
| 1701 | 2F | Q09 | Q07 | 3.61 | 5 | 72.2 |  | 3.61 |  |  |  | 4.42 | 3.92 | 3.48 | 2.70 | 1.50 | 0.74 |
| 1701 | 2F | Q10 | Q08 | 2.36 | 4 | 59.0 |  | 2.36 |  |  |  | 3.10 | 2.60 | 2.13 | 1.41 | 0.77 | 0.28 |
| 1701 | 2F | Q12 | Q09 | 1.58 | 3 | 52.7 |  | 1.58 |  |  |  | 2.57 | 1.74 | 1.07 | 0.40 | 0.11 | 0.05 |
| 1701 | 2F | Q13ab | Q10 | 2.17 | 3 | 72.3 |  | 2.17 |  |  |  | 2.80 | 2.53 | 2.03 | 1.14 | 0.52 | 0.33 |
| 1701 | 2FR | Q14 | Q11 | 1.51 | 2 | 75.5 |  | 1.51 |  |  |  | 1.79 | 1.43 | 1.11 | 1.00 | 0.50 | 0.00 |
| 1701 | 2F | Q15 | Q12 | 3.32 | 5 | 66.4 |  | 3.32 |  |  |  | 4.45 | 3.68 | 2.85 | 1.98 | 0.95 | 0.41 |
| 1701 | 2F | Q16 | Q13 | 2.07 | 3 | 69.0 |  | 2.07 |  |  |  | 2.70 | 2.37 | 1.83 | 1.19 | 0.69 | 0.41 |
| 1701 | 2F | Q17 | Q14 | 0.52 | 3 | 17.3 |  | 0.52 |  |  |  | 1.16 | 0.35 | 0.11 | 0.04 | 0.00 | 0.00 |
| 1701 | 2F | Q18 | Q15 | 3.15 | 5 | 63.0 |  | 3.15 |  |  |  | 4.44 | 3.77 | 2.59 | 1.14 | 0.55 | 0.39 |
| 1701 | 3H | Q05cde | Q16 | 5.03 | 7 | 71.9 |  | 5.03 | 6.65 | 5.99 | 5.41 | 4.34 | 2.49 | 1.30 |  |  | 0.36 |
| Sp ppr | 2F | Q17 | Q17 |  | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1701 | 1F | Q22 | Q18 | 1.58 | 6 | 26.3 |  | 1.58 |  |  |  | 2.76 | 1.48 | 0.98 | 0.67 | 0.28 | 0.02 |
| 1706 | 4HR | Q10 | Q19ab | 1.91 | 2 | 95.5 |  | 1.91 | 1.99 | 1.97 | 1.93 | 1.82 | 1.57 | 1.01 |  |  | 0.44 |
| 1701 | 4H | Q04b | Q19c | 1.59 | 2 | 79.5 |  | 1.59 | 1.92 | 1.79 | 1.71 | 1.40 | 1.06 | 0.80 |  |  | 0.37 |
| SAMs | 1F | Q23 | Q20 |  | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1701 | 2FR | Q24 | Q21 | 2.44 | 7 | 34.9 |  | 2.44 |  |  |  | 3.78 | 1.07 | 0.75 | 0.83 | 0.25 | 0.00 |
| 1601 | 2F | Q24 | Q22 | 0.58 | 4 | 14.5 |  | 0.58 |  |  |  | 1.22 | 0.22 | 0.08 | 0.02 | 0.00 | 0.00 |
|  |  |  |  | **54.82** | **100** | **59.6** |  | **54.82** |  |  |  | **68.28** | **52.98** | **42.42** | **29.22** | **18.57** | **11.76** |

| Q | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | (a) |  | 1, 2, 5, 7, 10, 14, 35, 70 | 2 | B2 | Award B1 for any four correct factors. |
|  | (b) |  |  | 2 | M1 | for using 9113 and 738 |
|  |  |  | 8375 |  | A1 | cao |
|  |  |  |  |  |  | **Total 6 marks** |

| 2 | (a) (i) |  | (5, 1) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  |  | 1 | B1 |  |
|  | (b) |  | *D*(3, 3) marked | 1 | B1 | Condone omission of *D* if unambiguous. |
|  | (c) |  |  | 2 | M1 | For $\frac{2}{4}$ or oe or a clear attempt to work out  for *AB* (condone omission of negative sign) |
|  |  |  |  |  | A1 | oe |
|  |  |  |  |  |  | **Total 5 marks** |

| 3 | (a) |  |  | 1 | B1 | oe  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | any three squares shaded | 1 | B1 |  |
|  | (c) | Eg or or   |  | 2 | M1 | For a complete methodIf M1 not awarded thenSCB1 for 129.5 |
|  |  |  | 55.5 |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 4 | (a) | Square width 6 with hole width 4. | correct shape drawn | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 20, 24 | 1 | B1 |  |
|  | (c) | Eg  or  or or(8, 12, 16, 20, 24), 28, 32, 36, 40 |  | 2 | M1 | For a complete method orFor a sequence continued to at least the ninth term, following through a single arithmetical error or For 4*n* +4 |
|  |  |  | 40 |  | A1 |  |
|  | (d) |  | 10 | 1 | B1 |  |
|  | (e) |  |  | 2 | B2 | oe B1 for *n* + 2 or  |
|  |  |  |  |  |  | **Total 7 marks** |

| 5 | (a) (i) |  |  | 2 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  |  |  | B1 |  |
|  | (b)  | Eg  or or $\frac{48}{6}$ or $\frac{12}{6}$  |  | 2 | M1 | For a complete method |
|  |  |  | 2 |  | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 6 | (a)  |  |  | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b)  |  | France | 1 | B1 |  |
|  | (c) | height  | correct bar drawn | 1 | B1 | any width |
|  | (d) |  |  | 2 | M1 | For  |
|  |  |  | 129 |  | A1 |  |
|  | (e) |  or 23 or  or 22.5 |  | 2 | M1 | For an ordered list at least as far as the first 2 |
|  |  |  | 2 |  | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |

| 7 | (a) (i) |  | 69 | 2 | B1 | allow  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  | 98 |  | B1 | allow  |
|  | (b) |  |  | 1 | B1 |  |
|  | (c) | Eg  or $\frac{50}{5}$ |  | 2 | M1 | For a complete method |
|  |  |  | 10 |  | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 8 | (a)  |  |  | 2 | M1 | accept 12 or 12.2 or 12.19 multiplied by a value in the range 9 to 15 |
| --- | --- | --- | --- | --- | --- | --- |
|  |   |  | 146 |  | A1 | accept 108 to 183  |
|  | (b) |  |  | 2 | M1 |  |
|  |  |  | 37.2 |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 9 |  | Eg or oeOr or oeOr 750 ÷ $\frac{530}{715.5}$ or 715.5÷ $\frac{530}{750}$ oe |  | 3 | M2 | For a complete methodIf not M2 then M1 for or 1.35 oe or$\frac{530}{715.5}$ or 0.740(740…) oe oror 1.41(509...) oe$\frac{530}{750}$ or 0.706(666…) oe  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 1012.50 |  | A1 | Accept 1012.5 |
|  |  |  |  |  |  | **Total 3 marks** |

| 10 | (a) |  |  | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | Eg  or 24 $-$ 15 |  | 2 | M1 | For a correct substitution |
|  |  |  | 9 |  | A1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 11 |  | $\frac{4}{2}$ (6 + 10) | 32  | 2 | M1A1 | For a complete method. |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

| 12 | (a) (i) |  | 9.746794345 | 2 | B1 | Allow 9.7467(94345…) rounded or truncated to at least 5SF |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  | 9.75 |  | B1 | ft if at least 3DP given in (i) |
|  | (b) (i) | or  |  | 3 | M1 | For 32.8(58...) rounded or truncated to at least 3SF seen |
|  |  |  | 7.791004515 |  | A1 | Allow 7.791(0045...) rounded or truncated to at least 4SF |
|  |  (ii) |  | 7.79 |  | B1 | ft if at least 4SF given in (i) |
|  |  |  |  |  |  | **Total 5 marks** |

| 13 | (a) (i) |  |  | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  |  | 1 | B1 |  |
|  | (b) |  | 35 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 14 | (a) | a, b, d, e | a, b, d, e | 2 | B2 | B1 for a, e **or** a, b, d **or**  b, d, e **or**a, b, e **or** a, d, e **or**a, b, c, d, e **or**  a, b, d, e, for a Venn diagram with a, c, e, f correctly shown |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | c, e, f | 1 | B1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 15 | (a) |  or 0.3 |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  or  |  |  | M1 | dep |
|  |  |  | 0.15 |  | A1 |  |
|  | (b) |  |  | 2 | M1 |  |
|  |  |  | 80 |  | A1 | Note: Award M1A1 for 80 out of 200Award M1A0 for 80/200  |
|  |  |  |  |  |  | **Total 5 marks** |

| 16 | (a) | 7 × (−2)² + 5 or 7 × 4 + 5 or7 (−2)² + 5  |  | 2 | M1 | for correct substitution **or** 7 × 4 **or** 28 |
| --- | --- | --- | --- | --- | --- | --- |
|  | 33 |  | A1 |  |
|  | (b) | 5*q* – 15 (= 12 – *q*)or  |  | 3 | M1 |  |
| E.g. 5*q* + *q* = 12 + 15 or 6*q* = 27 |  |  | M1 | For a correct equation with the *q* terms collected on one side of the equation and the non *q* terms on the other side.ft from 5*q* – 3 = 12 – *q* for this mark only |
|  | 4.5 |  | A1 | for 4.5 **or** oe dep on at least M1 |
|  | (c) | −7*t* $\geq $31 – 3 or 7*t* ≤ 3 – 31 oe |  | 2 | M1  | −7*t* $\geq $31 – 3 **or** 7*t* ≤ 3 – 31 **or** − 4 **or** *t* ≥ −4accept an equation or the wrong inequality sign in the working |
|  | *t*$ \leq $ −4 |  | A1 | or for −4 ≥ *t* |
|  |  |  |  |  |  | **Total 7 marks** |

| 17 | (a) |  | 4*n* + 3 | 2 | B2 | B1 for 4*n* + *x* where *x* is any integer |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 78, 76, 74 | 2 | B2 | B1 for one correct term |
|  | (c) |  | Correct reason | 1 | B1 | The first sequence is only odd numbers and the second is only even numbers |
|  |  |  |  |  |  | **Total 5 marks** |

| 18 | (a) | 18 ÷ 60 oe or7.3 or  or  or 7 × 60 + 18 (=438) |  | 3 | M1 | for changing time to a decimal (7.3) |
| --- | --- | --- | --- | --- | --- | --- |
| 750 × “7.3” oe or 750 ×  oe |  |  | M1 | for speed × time(allow 750 × 7.18 **or** answer of 5385) |
|  | 5475 |  | A1 |  |
|  |  (b) | for at least one correct operationeg. 750 × 1000, 750 ÷ 60 or or   |  | 3 | M1 | for **one or two** of ×1000, ÷60, ÷60 (can be implied by 750 000 **or** 12.5 **or**12500 **or** 0.2083) |
| oe |  |  | M1 | complete correct method |
|  | 208 |  | A1 | accept answers in range 208 –   |
|  |  |  |  |  |  |  |
|  |  | Alternative mark scheme ft from (a) |  |  |  |  |
|  |   | “5475” × 1000 (=5475000) OR7 × 60 + 18 = 438 and 438 × 60 (=26280 (sec))  |  | 3 | M1 |  |
|  |  | “5475000” ÷ 26280 |  |  | M1 | depcomplete correct method |
|  |  |  | 208 |  | A1 | accept answers in range 208 –  |
|  |  |  |  |  |  | **Total 6 marks** |

| 19 | (a) |  | 22 000 000 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 9.5 × 105 | 1 | B1 |  |
|  | (c) |  |  | 2 | M1 | for 0.06 oe or  where *n* is a negative integer other than  |
|  |  |  |  |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Working** | **Answer** | **Mark** | **AO** | **Notes** |
| **20** |  | 22.50 ÷ 15 (=1.5) **or** 100 ÷ 15(=6.6….) |  |  | AO1 | M1 |  | M2 for 22.5 ÷ 0.15 |
|  |  | ‘1.5’ × 100 (=150) **or** ‘6.6…’ ×22.5(0) |  |  |  | M1 | dep |  |
|  |  |  | 150 | 3 |  | A1 |  |
|  |  |  |  |  |  |  | **Total 3 marks** |

| 21 | (a) | cos *x* =  or cos *x* = 0.545(4545...) |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (*x* = )  |  |  | M1 |  |
|  |  |  | 56.9 |  | A1 | 56.9 – 57 |
|  | (b) | 90 $–$ 56.9(4426885...) oe | 033 | 2 | M1ftA1ft | for complete method, ft from (a) if "(a)" < 90, 90 $–$ their *x*accept (0)33 – (0)33.1 or ft |
|  | (c)(i) |  | 105 | 2 | B1 |  |
|  | (c)(ii) |  | 115 | B1 | Accept  |
|  |  |  |  |  |  | **Total 7 marks** |

| **22** |  | 180 −  or  or 144 oe |  | 4 | M1 | Unless inconsistently labelled |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  or 18 |  |  | M1 | Or M2 for 144 – (180 – 144) |
|  |  | ‘144’ – 2 × ‘18’ |  |  | M1 |
|  |  |  |  108 |  | A1 | dep on M1 |
|  |  | *Alternative* |  |  |  |  |
|  |  | Pentagon approach – drawing in a pentagon or a statement recognising that the required angle is one of a regular pentagon  |  | 4 | M1 | May be implied by further work |
|  |  | 180 −  or   |  |  | M2 | (M1 for exterior angle of pentagon as long as not seen as interior angle or given as answer) |
|  |  |  | 108 |  | A1 | dep on M1 |
|  |  |  |  |  |  | **Total 4 marks** |