**IGCSE (9–1) Maths - practice paper 5F mark scheme**

**Results Plus data on 96 of the 100 marks:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Paper 5** |  |  |  |  |  | **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 | 1FR | Q02 | Q01 | 7.62 | 9 | 84.7 |  | 7.62 |  |  |  | 8.28 | 7.75 | 7.05 | 5.00 | 3.25 | 2.00 |
| 1701 | 1FR | Q03 | Q02 | 1.81 | 3 | 60.3 |  | 1.81 |  |  |  | 2.18 | 1.89 | 1.16 | 0.60 | 0.00 | 0.00 |
| 1701 | 1FR | Q04 | Q03 | 6.05 | 7 | 86.4 |  | 6.05 |  |  |  | 6.58 | 5.74 | 5.48 | 5.00 | 4.00 | 3.00 |
| 1701 | 2FR | Q07 | Q04 | 4.15 | 5 | 83.0 |  | 4.15 |  |  |  | 4.64 | 4.11 | 3.47 | 3.50 | 1.00 | 2.00 |
| 1701 | 1FR | Q07 | Q05 | 4.64 | 6 | 77.3 |  | 4.64 |  |  |  | 5.14 | 4.68 | 3.78 | 4.60 | 0.50 | 2.00 |
| 1701 | 1FR | Q08 | Q06 | 5.96 | 7 | 85.1 |  | 5.96 |  |  |  | 6.62 | 5.43 | 5.42 | 6.00 | 2.75 | 1.00 |
| 1701 | 1FR | Q10 | Q07 | 4.74 | 6 | 79.0 |  | 4.74 |  |  |  | 5.49 | 4.54 | 3.57 | 2.80 | 2.50 | 1.00 |
| 1701 | 1FR | Q11 | Q08 | 4.53 | 7 | 64.7 |  | 4.53 |  |  |  | 5.78 | 4.06 | 2.79 | 0.80 | 1.00 | 0.00 |
| 1701 | 2FR | Q16 | Q09 | 3.00 | 4 | 75.0 |  | 3.00 |  |  |  | 3.76 | 2.82 | 1.90 | 1.17 | 0.50 | 0.00 |
| 1701 | 2FR | Q20 | Q10 | 2.21 | 3 | 73.7 |  | 2.21 |  |  |  | 2.73 | 1.71 | 1.89 | 1.00 | 0.75 | 0.00 |
| 1701 | 2FR | Q19 | Q11 | 2.78 | 4 | 69.5 |  | 2.78 |  |  |  | 3.88 | 2.36 | 1.00 | 0.17 | 0.50 | 0.00 |
| 1701 | 3HR | Q01 | Q12 | 1.08 | 2 | 54.0 |  | 1.08 | 1.62 | 1.14 | 0.55 | 0.31 | 0.16 | 0.24 |  |  | 0.00 |
| 1701 | 1FR | Q16 | Q13 | 2.40 | 4 | 60.0 |  | 2.40 |  |  |  | 3.52 | 1.46 | 0.89 | 0.20 | 0.50 | 0.00 |
| 1701 | 2FR | Q22bc | Q14 | 2.14 | 4 | 53.5 |  | 2.14 |  |  |  | 3.06 | 1.39 | 1.06 | 0.17 | 0.75 | 0.00 |
| 1706 | 1FR | Q23 | Q15 | 1.39 | 3 | 46.3 |  | 1.39 |  |  |  | 2.10 | 1.49 | 1.08 | 0.72 | 0.08 | 0.00 |
| 1701 | 1FR | Q18 | Q16 | 2.44 | 4 | 61.0 |  | 2.44 |  |  |  | 3.12 | 2.47 | 0.74 | 0.60 | 1.75 | 0.00 |
| 1701 | 1FR | Q19 | Q17 | 1.23 | 4 | 30.8 |  | 1.23 |  |  |  | 2.22 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1701 | 2FR | Q23 | Q18 | 1.02 | 3 | 34.0 |  | 1.02 |  |  |  | 1.76 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1701 | 4HR | Q10 | Q19 | 2.19 | 4 | 54.8 |  | 2.19 | 3.33 | 2.17 | 1.34 | 0.65 | 0.14 | 0.08 |  |  | 0.00 |
| 1701 | 4HR | Q11 | Q20 | 1.23 | 2 | 61.5 |  | 1.23 | 1.85 | 1.37 | 0.67 | 0.31 | 0.13 | 0.00 |  |  | 0.00 |
| Sp ppr | 1F | Q22 | Q21 |  | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1701 | 1FR | Q20 | Q22 | 2.83 | 5 | 56.6 |  | 2.83 |  |  |  | 3.88 | 1.54 | 1.57 | 1.40 | 2.75 | 0.00 |
|  |  |  |  | **65.44** | **96** | **68.2** |  | **65.44** |  |  |  | **76.01** | **54.33** | **43.17** | **33.73** | **22.58** | **11.00** |

| Q | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | a |  | Friday | 1 | B1 | F or Fri |
|  | b |  | Twelve thousand and thirty eight | 1 | B1 |  |
|  | c |  | 4900 | 1 | B1 |  |
|  | d |  | 9780, 4695 | 2 | B2 | B1 for one correct |
|  | e | 15243 ÷ 1200 |  |  | M1 |  |
|  |  |  | 13 | 2 | A1 | accept 12.7 – 13 providing working seen |
|  | f | (9780 + 4853 + 12038 + 15243 + 4695 + 4801 + 11856) ÷ 7 or 63266 ÷ 7 |  |  | M1 | Full method |
|  |  |  | 9038 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 9 marks** |

| 2 | a |  | radius | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | chord | 1 | B1 |  |
|  | c |  | segment shaded | 1 | B1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 3 | a |  | 20 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | 9 | 1 | B1 | accept 6 < population < 10 |
|  | c |  | Argentina | 1 | B1 |  |
|  | d |  | explanation | 1 | B1 | eg. No as 1/5 of 20 is 4 |
|  | e |  | bar drawn  | 1 | B1 | 25 < height < 30 |
|  | f | E.g. 626 : 32  |  |  | M1 | or any other equivalent ratio **or** 16 : 313 |
|  |  |  | 313 : 16  | 2 | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |

| 4 | (a) |  | January  | 1 | B1 | Accept $–4$  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 13 $–$ $–$ 2  | 15 | 2 | M1A1 | Accept $–$2 $–$ 13 Accept $–$15 |
|  | (c) | $–$4 $+$ 28 or 28 $ –$ 4  |  24 | 2 | M1A1 | Accept 28 + $–$4 |
|  |  |  |  |  |  | **Total 5 marks** |

| 5 | ai |  | unlikely | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | aii |  | impossible | 1 | B1 |  |
|  | b |  |  |  | M1 | for  with *a* < 8 or  with *b* > 3 |
|  |  |  |   | 2 | A1 |  |
|  | c |  |  |  | M1 | for at least 3 correct pairs (ignore repeats) |
|  |  |  | E,W E,X F,W F,X G,W G,X | 2 | A1 | for all 6 pairs with no repeats |
|  |  |  |  |  |  | **Total 6 marks** |

| 6 | a |  | 3*p* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | 30*ef* | 1 | B1 |  |
|  | c |  | 5 | 1 | B1 |  |
|  | d |  | 4 | 1 | B1 |  |
|  | e | 23 = 3*c* + 5 |  |  | M1 | for substitution |
|  |  | 23 – 5 = 3*c*  |  |  | M1 | isolating term in *c* |
|  |  |  | 6 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |

| 7 | a | oe or 738 ÷ 9 (=82) or 2 × 738 (= 1476) |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 164 | 2 | A1 |  |
|  | b | 24 – 17 = 7 or  |  |  | M1 |  |
|  |  |  |   | 2 | A1 |  |
|  | c |   |  |  | M1 | or any 2 equivalent fractions with common denominators eg.  |
|  |  |  | shown | 2 | A1 | for completion |
|  |  |  |  |  |  | **Total 6 marks** |

| 8 | ai |  | 104 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | aii |  | Angles on a straight line sum to 180o | 1 | B1 |  |
|  | b | 360 – 76 – 130 (=154) |  |  | M1 |  |
|  |  | “154” ÷ 2 |  |  | M1 | dep |
|  |  |  | 77 | 3 | A1 |  |
|  | c | 360 ÷ 18 or  or   |  |  | M1 |  |
|  |  |  | 20 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |

| 9 | (a) | e.g.   |  | 2 | M1 | For  (=4.16(66..)) or  or 1.25 or  oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 125 |  | A1 |  |
|  | (b) | e.g.  or oe  |  | 2 | M1 | Complete method to find number made |
|  |  |  | 68 |  | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 10 |  | oe or 420 |  | 3 | M1 |  | [Award M2 for 1200 × (1 $–$ 0.35)] |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 1200 $–$ "420" |  |  | M1 | dep |
|  |  |  | 780 |  | A1 | SC M1 for 1620 |
|  |  |  |  |  |  | **Total 3 marks** |

| 11 |  | 30 × 20 or 600 |  | 4 | M1 | For area of rectangle |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | $π$ $×$ $8^{2}$ or 201.(0619298...) or  |  |  | M1 | Indep for area of circleeg $π$ $×$ $8^{2}$ or 201.(0619298..) or  |
|  |  | 30 × 20 $–$ $π$ $×$ $8^{2}$ |  |  | M1 |  |
|  |  |  | 399 |  | A1 | Accept 398 -399.1 |
|  |  |  |  |  |  | **Total 4 marks** |

| 12 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | −2 | −1 | 0 | 1 | 2 | 3 | 4 |
| *y* | 10 | 8 | 6 | 4 | 2 | 0 | −2 |

 | *y* = 6 – 2*x* drawn from *x* = −2 to*x* = 4 | 4 | B4 | For a correct line between *x* = −2 and *x* = 4 |
|  |  |  |  |  | B3 | For a correct straight line segment through at least 3 of (−2, 10) (−1, 8) (0, 6) (1, 4) (2, 2) (3, 0) (4, −2)**OR** for all of (−2, 10) (−1, 8) (0, 6) (1, 4) (2, 2) (3, 0) (4, −2)plotted but not joined |
|  |  |  |  |  | B2 | For at least 2 correct points plotted  |
|  |  |  |  |  | B1 | For at least 2 correct points stated (may be in a table) **OR** for a line drawn with a negative gradient through (0, 6) **OR**a line with gradient −2 |
|  |  |  |  |  |  | **Total 4 marks** |

| 13 |  | 1002 or 10 000  |  |  | M1 | e.g. 12 × 100² |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 120 000 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 14 | (b) |  or  or  | $$w^{9}$$ | 2 | M1A1 | For $\frac{w^{13}}{w^{4}}$ or *w* × $w^{8}$ or $w^{5}$ × $w^{4}$ |
| --- | --- | --- | --- | --- | --- | --- |
|  | (c) |  | 3 ≤ *x* < 9 | 2 | M1A1 | For *x* $\geq $3 or *x* < 9 or Accept [3, 9) or 9 > *x* ≥ 3 |
|  |  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **15a** |  | Correct trapezium(1, −1) (1, −2) (3, 1) (3, −2) |  | 1 | B1 |
| **b** |  | Correct triangle(−1, −2) (−1, 0) (2, −2) |  | 2 | B2(B1 for a rotation of 90o clockwise about a different centrei.e. a triangle in the same orientation as the correct triangle **or**rotation by 90o anticlockwise about (0, 2)) |
|  |  |  |  |  | **Total 3 marks** |

| 16 | a |  | 100 < *w* ≤ 110 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b | 85 × 3 + 95 × 5 + 105 × 7 + 115 × 4 + 125255 + 475 + 735 + 460 + 125 |  | 3 | M2 | for frequency × mid-interval for at least 3 products and summingIf not M2 then award M1 for multiplying consistently by value within intervals (eg. end of interval) and summing products **or** mid-intervals used but not summed. |
|  |  |  | 2050 |  | A1 | SC : B2 for an answer of 102.5 |
|  |  |  |  |  |  | **Total 4 marks** |

| 17 |  | 182 – (14÷2)2 (=275) |  | 4 | M1 |  | **or** M1 for cos*x* = **or** sin*y* =**or**   |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  or  or  or 16.5… or 16.6 |  |  | M1 |  | **or** M1 for *x* = cos -1  **or** *x* = 67.1…**or** *y* =  **or** *y* = 22.8…**or** *z* **=**  **or** *z*= 45.77... |
|  |  | 0.5 × 14 × “16.5…” or 35 |  |  | M1 |  | **or** M1 for 0.5×14×18×sin(“67.1…”) **or**0.5×18×18×sin(2×”22.8…”) **or** 0.5×18×18×sin(“45.77...”) |
|  |  |  | 116 |  | A1 | 116 – 116.1  NB Allow use of Hero’s formula |
|  |  |  |  |  |  | **Total 4 marks** |
|  |  | *Alternative scheme* |  |  |  |  |
|  |  | 25(25 – 18)(25 – 18)(25 – 14)(= 13475) oe |  | 4 | M2 |  |
|  |  | √13475 oe |  |  | M1 |  |
|  |  |  | 116 |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 18 |  | 160 $–$ 3*x* + 7*x* $–$ 20 = 180 or2(160 – 3*x*) + 2(7*x* $–$ 20) = 360 oe |  | 3 | M1 | For a correct equation |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. 4*x* = 180 – 140 or – 3*x* + 7*x* = 180 + 20 – 160 or 4*x* =40 or 14*x* – 6*x* = 360 – 320 + 40 oe |  |  | M1 | For isolating the terms in *x* in a correct equation |
|  |  |  | 10 |  | A1  | Dep on at least M1 |
|  |  |  |  |  |  | **Total 3 marks** |

| 19 | (a) |  |  | 2 | M1 | For with *a* = 4 or *b* = 3 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 111375 |  | A1 | Accept  oe |
|  | (b) |  |  | 2 | M1 | For  or  (and no 11) or *n* × 33 × 5² where *n* ≠ 11 |
|  |  |  | 2025 |  | A1 | Accept  oe |
|  |  |  |  |  |  | **Total 4 marks** |

| 20 |  |  | *y* = $–$2*x* + 1 | 2 | M1A1  | For *y* = $–$2*x* + *c* (*c* $\ne $ 1) or*y* = *mx* + 1or for a correct method to find the gradientor *m* = −2 and *c* = 1 statedor −2*x* + 1 or *L* = $–$2*x* + 1oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

| 21 | a |  | 93 000 000 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | Singapore | 1 | B1 |  |
|  | c | 1.382 × 109 − 1.327 × 109 oe or 55 000 000 |  |  | M1 | or for 5.5 × 10*n* *n* ≠ 7 |
|  |  |  | 5.5 × 107 | 2 | A1 |  |
|  |  |  |  |  |  | Total 4 marks |

| 22 | a | 12*x* = 36 |  | 3 | M1 | for addition of given equations **or** a complete method to eliminate *y* (condone one arithmetic error) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g.  |  |  | M1  | (dep) for method to find second variable |
|  |  |  | *x =* 3 oe, *y* = −2.5 |  | A1  | NB. Candidates showing no working score 0 marks |
|  | b | *k*2 + 9*k* – 5*k* − 45 |  | 2 | M1 | for 3 correct **or** all 4 terms correct ignoring signs **or***y*2 + 4*k* +….. **or** … + 4*k* − 45 |
|  |  |  | *k*2 + 4*k* − 45 |  | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |