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

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paper 1** |  |  |  |  | **Edexcel averages:** |
| **Year** | **Paper** | **Qu. no** | **New qu. no.** | **Mean score** | **Max score** | **Mean %** |  | **ALL** | **A\*** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **U** |
| 1706 | 1F | Q03 | Q01 | 5.42 | 6 | 90.3 |  | 5.42 |  |  |  | 5.66 | 5.51 | 5.38 | 5.04 | 4.23 | 2.45 |
| 1706 | 1F | Q04 | Q02 | 4.17 | 5 | 83.4 |  | 4.17 |  |  |  | 4.71 | 4.33 | 3.79 | 3.09 | 2.46 | 1.61 |
| 1706 | 1F | Q05 | Q03 | 3.08 | 4 | 77.0 |  | 3.08 |  |  |  | 3.69 | 3.30 | 2.71 | 1.72 | 0.92 | 0.16 |
| 1706 | 1F | Q06 | Q04 | 4.28 | 5 | 85.6 |  | 4.28 |  |  |  | 4.69 | 4.34 | 4.17 | 3.69 | 2.52 | 1.47 |
| 1706 | 2FR | Q06 | Q05 | 1.49 | 2 | 74.5 |  | 1.49 |  |  |  | 1.72 | 1.49 | 1.36 | 1.22 | 1.04 | 0.67 |
| 1706 | 1F | Q07 | Q06 | 3.24 | 4 | 81.0 |  | 3.24 |  |  |  | 3.73 | 3.46 | 2.88 | 2.28 | 1.32 | 0.83 |
| 1706 | 1F | Q08 | Q07 | 2.33 | 3 | 77.7 |  | 2.33 |  |  |  | 2.81 | 2.43 | 1.97 | 1.44 | 0.96 | 0.37 |
| 1706 | 1F | Q09 | Q08 | 3.56 | 6 | 59.3 |  | 3.56 |  |  |  | 4.71 | 3.76 | 2.54 | 1.37 | 0.57 | 0.19 |
| 1706 | 1F | Q11 | Q09 | 4.39 | 7 | 62.7 |  | 4.39 |  |  |  | 5.78 | 4.45 | 3.20 | 2.09 | 1.06 | 0.45 |
| 1706 | 1F | Q13 | Q10 | 3.39 | 5 | 67.8 |  | 3.39 |  |  |  | 4.01 | 3.43 | 3.02 | 2.26 | 1.42 | 0.89 |
| 1706 | 1F | Q14 | Q11 | 2.47 | 6 | 41.2 |  | 2.47 |  |  |  | 3.96 | 2.06 | 1.00 | 0.56 | 0.21 | 0.06 |
| 1706 | 1F | Q15 | Q12 | 1.86 | 4 | 46.5 |  | 1.86 |  |  |  | 2.62 | 1.86 | 1.18 | 0.56 | 0.20 | 0.03 |
| 1706 | 1F | Q16 | Q13 | 3.10 | 4 | 77.5 |  | 3.10 |  |  |  | 3.65 | 3.28 | 2.79 | 1.92 | 1.22 | 0.56 |
| 1706 | 1F | Q17 | Q14 | 1.93 | 5 | 38.6 |  | 1.93 |  |  |  | 3.37 | 1.43 | 0.55 | 0.16 | 0.06 | 0.03 |
| 1706 | 1F | Q18 | Q15 | 2.06 | 3 | 68.7 |  | 2.06 |  |  |  | 2.57 | 2.09 | 1.68 | 1.11 | 0.70 | 0.34 |
| 1701 | 1F | Q18 | Q16 | 1.48 | 3 | 49.3 |  | 1.48 |  |  |  | 2.23 | 1.61 | 1.12 | 0.78 | 0.35 | 0.05 |
| SAMs | 2F | Q18 | Q17 |  | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1701 | 2F | Q18a | Q18 | 1.84 | 3 | 61.3 |  | 1.84 |  |  |  | 2.67 | 2.24 | 1.42 | 0.56 | 0.21 | 0.16 |
| 1706 | 1F | Q20 | Q19 | 0.53 | 3 | 17.7 |  | 0.53 |  |  |  | 1.08 | 0.21 | 0.06 | 0.02 | 0.02 | 0.00 |
| 1706 | 1F | Q22 | Q20 | 1.84 | 6 | 30.7 |  | 1.84 |  |  |  | 2.68 | 1.65 | 1.13 | 0.64 | 0.36 | 0.22 |
| 1706 | 1F | Q21 | Q21 | 0.41 | 2 | 20.5 |  | 0.41 |  |  |  | 0.72 | 0.28 | 0.12 | 0.05 | 0.02 | 0.00 |
| 1506 | 3HR | Q14 | Q22 | 2.51 | 3 | 83.7 |  | 2.51 | 2.90 | 2.63 | 2.37 | 1.88 | 0.86 | 0.12 |  |  | 0.00 |
| SAMs | 1F | Q24 | Q23 |  | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1706 | 4HR | Q11 | Q24 | 2.40 | 3 | 80.0 |  | 2.40 | 2.91 | 2.69 | 2.26 | 1.62 | 0.82 | 0.44 |  |  | 0.10 |
|  |  |  |  | **57.78** | **92** | **62.8** |  | **57.78** |  |  |  | **70.56** | **54.89** | **42.63** | **30.56** | **19.85** | **10.64** |

| Q | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | (a) |  | 38,45 | 2 | B2 | B1 for 38 shown as sixth termB1 for 45 shown as seventh term ft from their "38" + 7 |
|  | (b) |  | added 7 | 1 | B1 | for correct explanationE.g. +7, 7 more, jumped forward by 7 oe **or** 7*n* $–$ 4 |
|  | (c) | 3 + 17 × 7 or 7 × 18 $–$ 4 or 7*n* $–$ 4**or**3, 10, 17, 24, 31, 38, 45, 52, 59, 66, 73, 80, 87, 94, 101, 108, 115, 122**or** E.g. 45 + 11 × 7 |  |  | M1 | NB: If a list is given then must show a clear intention of adding 7 with at least 4 terms after 45 (condone 1 arithmetic error)E.g. 45, 52, 59, 66, 73E.g. 38, 45, 52, 59, 66, 73 |
|  |  |  | 122 | 2 | A1 | SC : B1 for answer of 115 or 129  |
|  | (d) |  | 234 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 6 marks** |

| 2 | (a) |  | 7 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Bar with height 13 drawn | 1 | B1 |
|  | (c) |  | Correct explanation | 1 | B1  | Eg$\frac{1}{4}$of 20 is 5 (not 4); 4 × 4 = 16 ( MU scored 20 ); should be (not ) |
|  | (d) | 20 : 2 |  |  | M1 | for 20 : 2 **or** an answer of 1 : 10 **or** 1 and 10 with incorrect notation |
|  |  |  | 10:1 | 2 | A1 | allow 1 : 0.1 **or** 1 :   |
|  |  |  |  |  |  | **Total 5 marks** |

| 3 | (a) | Numbers in order 4, 8, 13, 16, 22, 36, 40, 55, 89 |  |  | M1 | for ascending or descending order. (condone 1 omission)  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 22 | 2 | A1 |  |
|  | (b) | 89 $–$ 4 |  |  | M1 | or for 4 and 89 seen togetherE.g. 4 to 89 **or**89 – *n* **or** *m* – 4  |
|  |  |  | 85 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 4 | (a) |  | Yellowknife | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 25 $–$ $–$ 5 **or** 25 + 5 **or** $–$5 $–$ 25 |  |  | M1 | working may be seen on a number line |
|  |  |  | 30 | 2 | A1 | accept $–$30 |
|  | (c) | $–$ 11 $–$ 6 | $–$ |  | M1 | or for an answer of 17working may be seen on a number line |
|  |  |  | 17 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 5 | (a) |  | 8 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 6 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 6 | (a) |  | 2 triangles shaded | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 0.4 | 1 | B1 |
|  | (c) | 6 × 3.2 $–$ 3 × $–$4 oe |  |  | M1 |  for a correct substitution **or** for 19.2 and (−)12 **or**an answer of 7.2 |
|  |  |  | 31.2 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 7 | i |  | 30 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ii |  | 32 | 1 | B1 |  |
|  | iii |  | 31 or 37 | 1 | B1 | for 31 **or** 37 **or** both |
|  |  |  |  |  |  | **Total 3 marks** |

| 8 | (a)(i) |  | radius | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (a)(ii) |  | 28 | 1 | B1 | accept 26 30 |
|  | (b)(i) |  | 30 | 1 | B1 |  |
|  | (b)(ii) |  | angles on a straight line add to 180$°$ | 1 | B1 | dep on B1 in (bi)**or** angles at a point add to 360o (and vertically opposite angles are equal) |
|  | (c)(i) |  | 150 | 1 | B1 |  |
|  | (c)(ii) |  | corresponding angles are equal | 1 | B1 | dep on B1 in (ci) |
|  |  |  |  |  |  | **Total 6 marks** |

| 9 | (a) |  | 3*x*² | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |  |  | M1 | for 2*e* or 9*f* |
|  |  |  | 2$–2$*e* + 9*f* oe | 2 | A1 |  |
|  | (c) |  | 8*ab* | 1 | B1 |  |
|  | (d) |  | 48 | 1 | B1 |  |
|  | (e) | E.g.5*y* = 14 $–$ 2 or $–$5*y* = 2 $–$ 14 or   |  |  | M1 | for a correct first step |
|  |  |  |  oe | 2 | A1 | for oe E.g. or 2.4 |
|  |  |  |  |  |  | **Total 7 marks** |

| 10 | (a) |  | 18 07 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 60 + (35 $–$ 7) or 53 + 35 or 1 h(our) 28 m(inutes) or 1 : 28 |  |  | M1 | or for clear evidence of working from 6:07 to 7:35 e.g. use of a diagram |
|  |  |  | 88 | 2 | A1 |  |
|  | (c) |  |  |  | M1 | for 3 35 **or** 8 17 **or** 15 77 **or** 3 77 **or**for clear attempt to add 8 h 42 min onto 7 35  |
|  |  |  | 4 17 am | 2 | A1 | SC: B1 for 04 17 **or** 4 17 **or** 4 17 pm **or** 16 17 |
|  |  |  |  |  |  | **Total 5 marks** |

| 11 | (a) |  | 5(2*a* + 5) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | *w*(7*w* 4) | 1 | B1 |  |
|  | (c) |  |  |  | M1 | for *p*³ or (−)5*p*² |
|  |  |  | *p*³ 5*p*² | 2 | A1 |  |
|  | (d) | *x*² + 7*x* − 3*x* − 21 |  |  | M1 | for 3 correct terms **or** 4 correct terms ignoring signs **or** *x*² + 4*x* + c **or** .... + 4*x* 21 |
|  |  |  | *x*² + 4*x* 21 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 6 marks** |

| 12 | (a) |  | Vertices at (5, 3) (5, 9) (3, 9) (3, 5) (1, 5) (1, 3)  | 2 | B2 | If not B2 then awardB1 for shape of correct size and orientation in incorrect position **or** 4 out of 6 vertices correct |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Vertices at (7, 1) (7, 3) (4, 3) (4,2) (6, 2) (6,1 ) | 2 | B2 | If not B2 then awardB1 for correct orientation but incorrect position orB1 for rotation 90$°$clockwise about (7, 3) |
|  |  |  |  |  |  | **Total 4 marks** |

| 13 | (a) | E.g.  |  |  | M1 | for a correct scale factor or a correct first stepE.g. or 75 or  or 2.5 or300 ÷ 4 (=75) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 750 | 2 | A1 |  |
|  | (b) | E.g. |  |  | M1 | for a correct scale factor or a correct first stepE.g.  or 8 or  or 28.75 |
|  |  |  | 32 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 14 | (a) |  | 3 < *L* ≤ 4 | 1 | B1 | Accept 3 4 |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | Eg 0.5 4 + 1.5×5 + 2.5×11 + 3.5×14 + 4.5×6 or 2 + 7.5 + 27.5 + 49 + 27 or 113 |  |  | M2 | *f* × *d* for at least 4 products with correct mid- interval values **and** intention to add.If not M2 then award M1 for *d* used consistently for at least 4 products within interval (including end points) **and** intention to add **or** for at least 4 correct products with correct mid-interval values with no intention to add |
|  |  | (0.5 × 4 + 1.5 × 5 + 2.5 × 11 + 3.5 × 14 + 4.5 × 6) ÷ 40or 113 ÷ 40 |  |  | M1 | dep on M1 (ft their products)NB: accept their 40 if addition of frequencies is shown |
|  |  |  | 2.8 | 4 | A1 | Allow 2.82, 2.83 or 2.825 |
|  |  |  |  |  |  | **Total 5 marks** |

| 15 | (a) |  |  |  | M1 | for  **or** 1.46875 **or**  **or** 4.84 **or** **or** 6.30875 truncated or rounded to at least 1 dp |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 6.30875 | 2 | A1 |  |
|  | (b) |  | 6.31 | 1 | B1 | ft from (a) provided answer to (a) has more than 3 sig figs |
|  |  |  |  |  |  | **Total 3 marks** |

| 16 |  | 96 ÷ 3 (= 32) |  | 3 | M1 |  | M2 for   |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9 × ‘32’(=288) **or** 4 × ‘32’(=128) **or** (9 − 4) × ‘32’ |  |  | M1 | dep |
|  | 160 |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Working** | **Answer** | **Mark** | **AO** | **Notes** |
| **17** |  |  (10 + 14) × 9oe (= 108) |  |  | AO2 | M1 | for area of cross section |
|  |  | ‘108’ × 6 (=648) |  |  |  | M1 | (dep on previous M1) for volume of prism |
|  |  | ‘648’ × 0.7 |  |  |  | M1 | (independent) |
|  |  |  | 453.6 | 4 |  | A1 | accept 454 |
|  |  |  |  |  |  |  | **Total 4 marks** |

| 18 |  | 0.3 + *x* + 3*x* = 1 |  |  | M1 | oe, e.g. 4*x* = 0.7 | M1 for (20 – “6”) ÷ 4 (=3.5) |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | (1 – 0.3) ÷ 4 or 0.175 or(1 – 0.3) × 0.75 |  |  | M1 | complete method to find *x*or 3*x* | M1 for   |
|  |  |  | 0.525  | 3 | A1 | oe, e.g.  , 52.5% | A1 or 0.525 oe |
|  |  |  |  |  |  | **Total 5 marks** |

| 19 |  | cos22 = $\frac{14.9}{AC}$or oroe **or** |  |  | M1 |  | M1 for *BC* = 14.9 × tan22 oe (= 6.019 – 6.02)**AND** (*AC*2 = ) 14.92 + 6.019…2 |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | (*AC* = ) or( × sin 90) |  |  | M1 |  | M1 for (*AC* ) =   |
|  |  |  | 16.1 | 3 | A1 | Accept 16.07 − 16.1 |
|  |  |  |  |  |  | **Total 3 marks** |

| 20 | (a) | 668.8 640 or 28.8 |  |  | M1 |  | M2 for  **or**  1.045 **or** 104.5  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | "28.8" ÷ 640 (×100) or 0.045 |  |  | M1 | dep |
|  |  |  | 4.5 | 3 | A1 |  |  |
|  | (b) | oe or oe  |  |  | M2 | for a complete methodIf not M2 then award M1 for (=7.04) **or** 0.95*x* = 668.8 oe |
|  |  |  | 704 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 6 marks** |

| 21 |  | Arc centre *Q* cutting *QP* and *QR* at *A* and *B* with *AQ* = *BQ* and arcs with same radius centre *A* and *B* intersecting in guidelines |  |  | M1 | for a relevant pair of intersecting arcs within guidelines |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Correct angle bisector | 2 | A1 | dep on M1SC: B1 for line within guidelines  |
|  |  |  |  |  |  | **Total 2 marks** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **22**  | 16*x* – 8*y* = 1412*x* – 8*y* = 64*x* = 8 |  | 3 | M1 for appropriate multiplication to get coefficients of *x* or *y* the same (condone one arithmetic error) with the correct operation to eliminate one variable **or** for correct rearrangement of one equation followed by substitution in the other (condone one arithmetic error). |
|  |  |  | M1(dep) to find value of second variable ft from value of their first variable  |
|  |  | *x* = 2 *y* = 2.25oe | A1 Award 3 marks for correct values if at least first M1 scored |
|  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Working** | **Answer** | **Mark** | **AO** | **Notes** |
| **23** | **a** |  | 140 000 | 1 | AO1 | B1 |  |
|  | **b** |  | Mars | 1 | AO1 | B1 |  |
|  | **c** | 1.2 × 105 – 5 × 104 **or** |  |  | AO1 | M1 |  |
|  |  | 120 000 – 50 000 **or** 70 000 oe |  |  |  |  |  |
|  |  |  | 7 × 104 | 2 |  | A1 |  |

| **24** |  | 7500 × 0.04 or 300 or 7500 × 1.04 or 7800 or 7500 × $1.04^{n}$ (*n* > 1 )Eg 7500 +⨯7500 + ⨯(7500 + “300”) +⨯(7500 + “300” + “312”) or7500 + “300” + “312” + “324.48” | 8436.48 | 3 | M1M1  | For interest for first year or for 7500 × 0.04 × 3 oe or 900 or for 7500 + 7500 × 0.04 × 3 oe or an answer of 8400For a complete method | M2 for 7500⨯ 1.043 oe |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A1 | Accept answers in the range 8436 – 8437NB: Answer in the range 936 -937 gets M2A0 |
|  |  |  |  |  |  | **Total 3 marks** |