**IGCSE (9–1) Maths - practice paper 6F mark scheme**

**Results Plus data on 86 of the 100 marks:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Paper 6** |  |  |  |  |  | **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 | 2FR | Q03 | Q01 | 2.75 | 4 | 68.8 |  | 2.75 |  |  |  | 3.45 | 2.60 | 1.68 | 1.33 | 0.00 | 0.00 |
| 1701 | 2FR | Q04 | Q02 | 3.13 | 4 | 78.3 |  | 3.13 |  |  |  | 3.57 | 3.11 | 2.58 | 2.34 | 0.50 | 0.00 |
| 1701 | 2FR | Q05 | Q03 | 3.94 | 5 | 78.8 |  | 3.94 |  |  |  | 4.50 | 4.09 | 3.32 | 1.51 | 1.00 | 2.00 |
| 1701 | 2FR | Q06 | Q04 | 5.15 | 6 | 85.8 |  | 5.15 |  |  |  | 5.63 | 5.36 | 3.95 | 5.17 | 2.00 | 3.00 |
| 1706 | 2FR | Q07 | Q05 | 3.77 | 6 | 62.8 |  | 3.77 |  |  |  | 4.81 | 3.78 | 2.91 | 2.92 | 1.54 | 0.66 |
| 1701 | 1FR | Q05 | Q06 | 1.64 | 2 | 82.0 |  | 1.64 |  |  |  | 1.82 | 1.57 | 1.37 | 1.60 | 0.75 | 0.00 |
| 1701 | 2FR | Q08 | Q07 | 1.90 | 4 | 47.5 |  | 1.90 |  |  |  | 2.33 | 1.96 | 1.10 | 0.66 | 0.25 | 0.00 |
| 1701 | 1FR | Q09 | Q08 | 2.86 | 4 | 71.5 |  | 2.86 |  |  |  | 3.37 | 2.64 | 2.26 | 1.80 | 0.75 | 0.00 |
| 1701 | 2FR | Q10 | Q09 | 2.82 | 3 | 94.0 |  | 2.82 |  |  |  | 2.97 | 2.79 | 2.68 | 2.50 | 2.25 | 0.00 |
| 1701 | 2FR | Q11 | Q10 | 3.34 | 4 | 83.5 |  | 3.34 |  |  |  | 3.83 | 3.25 | 2.73 | 2.00 | 1.50 | 0.00 |
| 1706 | 2F | Q13 | Q11 | 1.63 | 4 | 40.8 |  | 1.63 |  |  |  | 2.76 | 1.36 | 0.49 | 0.22 | 0.07 | 0.00 |
| 1701 | 1FR | Q12 | Q12 | 1.06 | 2 | 53.0 |  | 1.06 |  |  |  | 1.45 | 0.89 | 0.47 | 0.00 | 0.25 | 0.00 |
| 1701 | 1FR | Q13 | Q13 | 1.69 | 3 | 56.3 |  | 1.69 |  |  |  | 2.33 | 1.29 | 0.68 | 1.00 | 0.00 | 0.00 |
| 1701 | 1FR | Q14 | Q14 | 2.29 | 5 | 45.8 |  | 2.29 |  |  |  | 3.49 | 1.00 | 0.84 | 1.00 | 0.25 | 0.00 |
| 1701 | 2F | Q18a | Q15 | 1.84 | 3 | 61.3 |  | 1.84 |  |  |  | 2.67 | 2.24 | 1.42 | 0.56 | 0.21 | 0.16 |
| 1706 | 2FR | Q19 | Q16 | 1.37 | 2 | 68.5 |  | 1.37 |  |  |  | 1.73 | 1.35 | 1.33 | 0.87 | 0.50 | 0.17 |
| 1701 | 1FR | Q17 | Q17 | 2.59 | 5 | 51.8 |  | 2.59 |  |  |  | 3.55 | 1.75 | 1.42 | 0.80 | 0.75 | 1.00 |
| 1701 | 1F | Q19 | Q18 | 0.75 | 3 | 25.0 |  | 0.75 |  |  |  | 1.60 | 0.55 | 0.25 | 0.22 | 0.04 | 0.00 |
| 1706 | 2FR | Q22b | Q19 | 1.59 | 4 | 39.8 |  | 1.59 |  |  |  | 2.87 | 1.06 | 0.96 | 0.22 | 0.00 | 0.00 |
| 1701 | 1F | Q20 | Q20 | 2.25 | 7 | 32.1 |  | 2.25 |  |  |  | 4.30 | 2.17 | 0.93 | 0.76 | 0.08 | 0.00 |
| Sp ppr | 1F | Q18d | Q21 |  | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1506 | 4H | Q12 | Q22 | 2.32 | 3 | 77.3 |  | 2.32 | 2.82 | 2.48 | 2.07 | 1.51 | 0.83 | 0.39 |  |  | 0.25 |
| Sp ppr | 1F | Q20 | Q23 |  | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1601 | 4HR | Q11 | Q24 | 2.11 | 3 | 70.3 |  | 2.11 | 2.62 | 2.11 | 1.32 | 0.70 | 0.23 | 0.00 |  |  | 0.00 |
| SAMs | 1F | Q25 | Q25 |  | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | **52.79** | **86** | **61.4** |  | **52.79** |  |  |  | **65.24** | **45.87** | **33.76** | **27.48** | **12.69** | **7.24** |

| Q | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | (a)(i) |  | 9 | 3 | B1 |  |
|  | (a)(ii) |  | 20 | B1 |  |
|  | (a)(iii) |  | Correct line of symmetry | B1 |  |
|  | (b) |  | Obtuse angle marked | 1 | B1 |
|  |  |  |  |  |  | **Total 4 marks** |

| 2 | (a) |  | 8.65 | 1 | B1 |
| --- | --- | --- | --- | --- | --- |
|  | (b) |  | 7.27 | 1 | B1 |
|  | (c)(i) |  | 7.235 marked on diagram | 2 | B1 |
|  | (c)(ii) |  | 7 | B1 |
|  |  |  |  |  |  | **Total 4 marks** |

| 3 | (a) |  | (4, 5) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | ( $–4$, 1)  | 1 | B1 |  |
|  | (c) |  | Pentagon | 1 | B1 |  |
|  | (d) |  | 6.4 | 1 | B1 | Allow 6.3 to 6.5 inclusive |
|  | (e) |  | 39 | 1 | B1 | Allow 37 $–$ 41 inclusive |
|  |  |  |  |  |  | **Total 5 marks** |

| 4 | (a) |  | 13 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Add 3 | 1 | B1 | Accept +3, 3 more, jumped forward by 3, difference = 3 oe or 3*n* $+$ 1 |
|  | (c) | 4 + 11 × 3 or 4 + 12 × 3 or 3*n* + 1Or4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37 | 37 | 2 | M1A1 | Allow 4 + 12 × 3 or 34 or 40List should show a clear intention of adding 3 with at least 5 terms (including 16). Condone 1 arithmetic error. |
|  | (d) | 67 $–$ 1 or 3*x* + 1 = 67 | 22 | 2 | M1A1 | cao |
|  |  |  |  |  |  | **Total 6 marks** |

| 5 | (a) (i) |  | centimetres | 1 | B1 | cm allow any unambiguous spelling |
| --- | --- | --- | --- | --- | --- | --- |
|  |  (ii) |  | kilograms | 1 | B1 | kg allow any unambiguous spelling |
|  |  (iii) |  | Square metres | 1 | B1 | m2 allow any unambiguous spelling |
|  | (b) |  3 × 150 or 3 × 0.152000 – 3 × 150 or 1550 or 2 – 3 × 0.15 or 1.55 | 1550 m*l*Or1.55 *l* | 3 | M1 M1A1  | or for 2 × 1000 or 2000 or150 ÷ 1000 or 0.15 or450 ÷ 1000 or 0.45  SCB1 for 1850 m*l* or 1.85 *l* |
|  |  |  |  |  |  | **Total 6 marks** |

| 6 | a |  | 23 or 29 or 31 or 37 | 1 | B1 | accept one or more of 23, 29, 31, 37 with no incorrect numbers |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | 343 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 7 | (a) | 224 $–$ 14 | 210 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  | (b) | Numbers in order 14, 160, 166, 190, 192, 224 | 178 | 2 | M1A1 | Ascending or descending order. Condone 1 omission. |
|  | (c) |  | Correct explanation | 1 | B1 | Eg 14 affects the mean or 14 does not affect the median.  |
|  |  |  |  |  |  | **Total 4 marks** |

| 8 | a |  | 9.9 | 1 | B1 | accept 9.8 – 10  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | 73 | 1 | B1 | accept 72 - 74 |
|  | c | eg. 100 HKD = 8.2 and 8.2×10 |  |  | M1 | complete method |
|  |  |  | 82 | 2 | A1 | accept 80 – 85  |
|  |  |  |  |  |  | **Total 4 marks** |

| 9 |  | 20 $–$ 6 × 2.96 | £2.24 | 3 | M2A1 | For a complete methodM1 for 6 × 2.96 or 17.76SCM1 for 17.04 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 3 marks** |

| 10 | (a) |  | $$\frac{23}{100}$$ | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | Eg 0.533(33...), 0.555(55....), 0.59, 0.6, 0.61  | $\frac{8}{15}$, $\frac{5}{9}$, 0.59, $\frac{3}{5}$, 61%  | 3 | B3 | Accept correct decimal/percentage equivalents in ascending order If not B3 then award B2 For 4 numbers in the correct order orFor $\frac{8}{15}$, $\frac{5}{9}$, or $\frac{3}{5}$ correctly converted to decimals or %s (at least 3 SF rounded or truncated) orFor all five numbers in correct descending order.If not B2 then B1 for:2 fractions correctly converted to decimals or %s (at least 3 SF rounded or truncated)  |
|  |  |  |  |  |  | **Total 4 marks** |

| 11 | (a) |  oe |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 70 | 2 | A1 | cao |
|  | (b) | oe |  |  | M1 |  |
|  |  |  | 144 | 2 | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 12 |  |   |  |  | M1 | for **or  or** (6, *y*) **or** (*x*, 7)**or** (7, 6) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | (6 , 7) | 2 | A1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 13 |  | 15 ÷ 60 (=0.25) or 13.25 or 13 × 60 + 15 (=795) or 13 × 3600 + 15 × 60 (=47700) |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 8740 ÷ “13.25” or 8740 ÷ “795” × 60 or8740 ÷ “47700” × 3600 |  |  | M1 | accept 8740 ÷ 13.15 or an answer of 664 - 665 |
|  |  |  | 660 | 3 | A1 | accept 659.6 – 660  |
|  |  |  |  |  |  | **Total 3 marks** |

| 14 |  | 80 ÷ (3 + 1) (=20) or 20 or 60 |  | 5 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 0.15 × (3 × “20”) (=9) |  |  | M1 |  | M1 for 0.85 × (3×”20”) = 51 |
|  |  | “20” ÷ 5 (=4) |  |  | M1 |  | M1 for × “20” (=16)  |
|  |  | 80 – “9” – “4”  |  |  | M1 |  | M1 for “16” + “51” |
|  |  |  | 67 |  | A1 |  |
|  |  | or |  |  |  |  |
| 14 |  | (= or 0.1125)  |  | 5 | M1 |  | M1 or 0.6375) |
|  |  |  (=or 0.05)  |  |  | M1 |  | M1 or 0.2) |
|  |  |  or “0.1125” + “0.05”(=0.1625) |  |  | M1 |  | M1   |
|  |  |  or (1−“0.1625”)×80 or  |  |  | M1 |  | M1 oe or  |
|  |  |  | 67 |  | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 15 |  |  or 0.3 |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  or  |  |  | M1 | dep |
|  |  |  | 0.15 |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 16 |  |  | 14.37028405 | 2 | M1A1 | 102.66 or 1.843(9...) or 7.143(9..)Accept 14.37(028......) rounded or truncated to at least 4SF |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

| 17 | a | 224 ÷ 8 oe |  | 2 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 28 |  | A1 |  |
|  | b | 523 – 411 (=112) or or (=127.3...)  |  | 3 | M1 |  |  |
|  |  |  or 100×“1.273” – 100 or “127.3” – 100 |  |  | M1 | dep |  |
|  |  |  | 27.3 |  | A1 | 27.25 – 27.3 |
|  |  |  |  |  |  | **Total 5 marks** |

| 18 |  | $\frac{17}{3}$ − $\frac{19}{5} $ $ $  |  | 3 | M1 | for correct improper fractions (subtraction sign not necessary)**OR** two improper fractions with a common denominator with at least one of the fractions correct |
| --- | --- | --- | --- | --- | --- | --- |
| E.g. $\frac{85}{15}$ − $\frac{57}{15} $ $ $ or  oe |  |  | M1 | for correct fractions with a common denominator a multiple of 15 i.e. in form $ \frac{85a}{15a}$ − $\frac{57a}{15a}$ |
|  |  | shown |  | A1 | dep on M2 for correct conclusion tofrom correct working **with** sight of the result of the subtraction e.g. |
|  |  | Alternative method |  |  |  |   |
|  | (5)$\frac{10}{15}$ – (3)$ \frac{12}{15}$ |  | 3 | M1 | for two correct fractions with a common denominator a multiple of 15 |
| −$ \frac{2}{15}$ |  |  | M1 |  |
|  | shown |  | A1 | dep on M2 for correct conclusion tofrom correct working **with** sight of the result of the subtraction e.g.or 2 − $\frac{2}{15}$ |
|  | Alternative method |  |  |  |  |
| E.g. 5$\frac{10}{15}$ – 3$ \frac{12}{15}$ |  | 3 | M1 | for two correct fractions with a common denominator a multiple of 15 |
| E.g. 4$\frac{25}{15}$ – 3$ \frac{12}{15}$  |  |  | M1 | for a complete correct method |
|  |  |  | shown |  | A1 | dep on M2 for correct conclusion tofrom correct working |
|  |  |  |  |  |  | **Total 3 marks** |

| 19 | (a) |  | 30 < *d* ≤ 40 | 1 | B1 | Accept  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 5×5 + 15×12 + 25×17 + 35×20 + 45×6 or25 + 180 + 425 + 700 + 270 or1600 |  | 4 | 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 |
|  |  | or  |  |  | M1 | dep on M1 (ft their products)NB: accept their 60 if addition of frequencies is shown  |
|  |  |   | 26.7 |  | A1  | Accept 26.6 – 26.7 inclusiveAccept 27 if M3 awardedDo not accept fractions or mixed numbers, eg  or   |
|  |  |  |  |  |  | **Total 5 marks** |

| 20 | (a) | (−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6) | Correct line between *x* = −1 and *x* = 5 | 4 | B4 | For a correct line between *x* = −1 and *x* = 5 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | B3 | For a correct line through at least 3 of (−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6) **OR** for all of **(**−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6) 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 seen in working **OR** for a line drawn with a negative gradient through (0, 4) **OR** for a line with the correct gradient. |
|  | (b) |  |  | 3 | M1 | for *y* = −4 drawn; accept full or dashed lineNB A shaded rectangle implies a choice of lines so M0 |
|  |  |  | M1 | for *x* = 1 drawn; accept full or dashed lineNB A shaded rectangle implies a choice of lines so M0 |
|  | For correct region identified |  | A1ft | for correct region identified.Condone no label if region clear.ft from an incorrect straight line in part (a)  |
|  |  |  |  |  |  | **Total 7 marks** |

| 21 |  | 6*x* – 5 = 2(*x* + 1) or 6*x* – 5 = 2*x* + 2 |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 6*x* – 2*x* = 2 + 5 |  |  | M1 |  |
|  |  |  | 1.75 | 3 | A1 | oe eg.  dep on at least M1 scored |
|  |  |  |  |  |  | **Total 3 marks** |

| **22** |  | eg ⨯65000 oe or 10400 | 65000⨯ 0.843  |  | 3 | M1 | For ⨯65000 oe or 10400 | (M2 for 65000⨯0.843)**or** (M1 for  65000⨯0.84or 54600or 65000⨯0.842 or 45864or 65000⨯0.844or 32361.63..) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ⨯ (65000 – “10400”)= 8736⨯ (65000 – “10400” – “8736”)= 7338.2465000 – “10400” – “8736”− “7338.24” |  | M1 | For completing Method |
|  |  |  |  |  | Accept (1 – 0.16) as equivalent to 0.84 throughout |
|  |  |  |  |  | **SC:** If no other marks gained, award M1 for 65000 x 0.48 oe (=31200) or 65000 ⨯ 0.52 oe (=33800)  |
|  |  |  | 38525.76 | A1 | for 38525 – 38526 |
|  |  |  |  |  |  | **Total 3 marks** |

| 23 | a | 0.03 × 180 000 (=5400) |  |  | M1 |  | M2 for 1.03 × 180 000 |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | “5400” + 180 000 |  |  | M1 | dep |
|  |  |  | 185 400 | 3 | A1 |  |
|  | b | 6630 = 85% oe or   |  |  | M1 |  | M2 for 6630 ÷ 0.85 |
|  |  | 6630 ÷ 85 × 100 or “78” × 100 |  |  | M1 | dep |
|  |  |  | 7800 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 6 marks** |

| 24 |  | *π* × (20 – 2×4) oe or *π* × 12 oe or 2×*π*×6 or37.6... or 37.7 or× *π* × (20 – 2×4) oe or × *π* × 12 oe or *π*×6 or 18.8… |  | 3 | M1 | for a correct method to find the circumference or half of the circumference |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 4 + 10 + 20 + 10 + 4 + × “37.6…” or4 + 10 + 20 + 10 + 4 + “18.8…” |  |  | M1  |  (dep on previous M1) for complete method |
|  |  |  | 66.8 |  | A1 | 66.8 – 66.9  |
|  |  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Working** | **Answer** | **Mark** | **AO** | **Notes** |
| **25** |  |   |  |  | AO2 | M1 |  |
|  |  | (*BC* = ) 5.7 |  |  |  | A1 |  |
|  |  |  × 7.6 × ‘5.7’ **or** 21.6(6) **or** 21.7 |  |  |  | M1 | dep on first M1 |
|  |  |  |  |  |  |  | or eg. *ACB =* sin−1(=53.1...) **and** |
|  |  |  |  |  |  |  | × 9.5 × '5.7' × sin'53.1' |
|  |  |  × *π* ×  **or** 12.7(587...) **or** 12.8 |  |  |  | M1 | dep on first M1 |
|  |  |  | 34.4 | 5 |  | A1 | for answer rounding to 34.4 |
|  |  |  |  |  |  |  | (*π*→ 34.4187... 3.14→34.4123...) |