**IGCSE (9–1) Maths - practice paper 2F mark scheme**

**Results Plus data on 93 of the 100 marks:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Paper 2** | | | | | | |  | **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 | 2F | Q01 | Q01 | 4.07 | 5 | 81.4 |  | 4.07 |  |  |  | 4.68 | 4.30 | 3.73 | 2.78 | 1.92 | 1.10 |
| 1706 | 2F | Q02 | Q02 | 4.14 | 7 | 59.1 |  | 4.14 |  |  |  | 5.32 | 4.08 | 3.18 | 2.28 | 1.71 | 1.43 |
| 1706 | 2F | Q03 | Q03 | 4.75 | 5 | 95.0 |  | 4.75 |  |  |  | 4.92 | 4.83 | 4.74 | 4.55 | 4.16 | 2.61 |
| 1706 | 2F | Q05 | Q04 | 4.23 | 5 | 84.6 |  | 4.23 |  |  |  | 4.68 | 4.40 | 4.08 | 3.28 | 2.45 | 1.23 |
| 1706 | 2F | Q07 | Q05 | 4.95 | 7 | 70.7 |  | 4.95 |  |  |  | 6.34 | 5.26 | 3.58 | 2.52 | 1.35 | 0.73 |
| 1706 | 2F | Q08 | Q06 | 3.65 | 5 | 73.0 |  | 3.65 |  |  |  | 4.41 | 3.76 | 3.12 | 2.22 | 1.57 | 0.67 |
| 1706 | 2F | Q11 | Q07 | 2.32 | 3 | 77.3 |  | 2.32 |  |  |  | 2.70 | 2.34 | 2.02 | 1.78 | 1.44 | 0.72 |
| 1706 | 2F | Q12 | Q08 | 3.41 | 6 | 56.8 |  | 3.41 |  |  |  | 5.11 | 3.34 | 1.72 | 0.79 | 0.33 | 0.09 |
| 1706 | 2F | Q15 | Q09 | 2.75 | 7 | 39.3 |  | 2.75 |  |  |  | 4.21 | 2.47 | 1.37 | 0.83 | 0.37 | 0.07 |
| 1706 | 2F | Q16 | Q10 | 3.85 | 5 | 77.0 |  | 3.85 |  |  |  | 4.63 | 4.14 | 3.32 | 2.22 | 1.35 | 0.53 |
| 1706 | 2F | Q17 | Q11 | 0.63 | 2 | 31.5 |  | 0.63 |  |  |  | 1.00 | 0.52 | 0.31 | 0.12 | 0.06 | 0.05 |
| 1706 | 2F | Q18 | Q12 | 1.87 | 5 | 37.4 |  | 1.87 |  |  |  | 2.75 | 1.64 | 1.13 | 0.73 | 0.35 | 0.23 |
| 1706 | 2F | Q19 | Q13 | 1.43 | 3 | 47.7 |  | 1.43 |  |  |  | 2.09 | 1.40 | 0.80 | 0.44 | 0.17 | 0.02 |
| 1706 | 2FR | Q18 | Q14 | 1.52 | 4 | 38.0 |  | 1.52 |  |  |  | 2.53 | 1.36 | 0.84 | 0.28 | 0.25 | 0.00 |
| SAMs | 2F | Q16 | Q15 |  | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1506 | 3H | Q03 | Q16 | 1.27 | 3 | 42.3 |  | 1.27 | 2.19 | 1.16 | 0.60 | 0.31 | 0.13 | 0.07 |  |  | 0.02 |
| SAMs | 2F | Q21 | Q17 |  | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1706 | 2F | Q21 | Q18 | 0.36 | 3 | 12.0 |  | 0.36 |  |  |  | 0.75 | 0.12 | 0.03 | 0.03 | 0.03 | 0.00 |
| 1706 | 2F | Q22 | Q19 | 1.58 | 4 | 39.5 |  | 1.58 |  |  |  | 2.73 | 1.24 | 0.48 | 0.16 | 0.07 | 0.00 |
| 1706 | 2F | Q23 | Q20 | 0.55 | 3 | 18.3 |  | 0.55 |  |  |  | 1.09 | 0.24 | 0.09 | 0.07 | 0.02 | 0.00 |
| 1506 | 4H | Q07de | Q21 | 3.07 | 4 | 76.8 |  | 3.07 | 3.75 | 3.26 | 2.71 | 2.05 | 1.31 | 0.57 |  |  | 0.09 |
| 1306 | 3HR | Q10 | Q22 | 3.41 | 4 | 85.3 |  | 3.41 | 3.83 | 3.64 | 2.97 | 1.95 | 0.87 | 0.00 |  |  |  |
| 1701 | 3H | Q10 | Q23 | 1.77 | 3 | 59.0 |  | 1.77 | 2.88 | 2.39 | 1.63 | 0.99 | 0.37 | 0.09 |  |  | 0.02 |
|  |  |  |  | **55.58** | **93** | **59.8** |  | **55.58** |  |  |  | **65.24** | **48.12** | **35.27** | **25.08** | **17.60** | **9.61** |

| Q | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | (a) |  | −8, −4, −1, 3, 7 | 1 | B1 | cao |
|  | (b) |  | 0.007, 0.078, 0.4, 0.407, 0.8 | 1 | B1 | cao |
|  | (c) |  | 0.6 | 1 | B1 | cao |
|  | (d) |  | 90 | 1 | B1 | cao |
|  | (e) |  | 0.35 | 1 | B1 | cao |
|  |  |  |  |  |  | **Total 5 marks** |

| 2 | (a) |  | cone | 1 | B1 | Accept circular based pyramid |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) (i) |  | prism | 1 | B1 | accept triangular based prism |
|  | (b) (ii) |  | 6 | 1 | B1 | cao |
|  | (b) (iii) |  | 9 | 1 | B1 | cao |
|  | (c) |  | 12 cm3 |  | B2 | If not B2 for 12 then allow B1 for 6 or 8 or 10 |
|  |  |  |  | 3 | B1 | for cm3 (indep) |
|  |  |  |  |  |  | **Total 7 marks** |

| 3 | (a) |  | Blues | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Jets | 1 | B1 | cao |
|  | (c) (i) | 8 ÷ 2 × 3 or 1 circle is 4 goals or 3 × 4 |  |  | M1 | can be implied by one correct answer |
|  |  |  | 12 | 2 | A1 | cao |
|  | (c) (ii) |  | 10 | 1 | A1 | cao |
|  |  |  |  |  |  | **Total 5 marks** |

| 4 | (a) | 3 × 1.59 + 2 × 0.85 + 5 × 0.45 (=8.72) or 4.77 + 1.7(0) + 2.25 |  |  | M1 | Condone 1 error only in numbers of items or if subtotals only seen, allow 1 error |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 20 – “8.72” |  |  | M1 |  |
|  |  |  | 11.28 | 3 | A1 | [SC B1 for 17.11] |
|  | (b) | 50 ÷ 2.40 or 20.83… |  |  | M1 |  |
|  |  |  | 20 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 5 | (a) |  |  | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 840 ÷ 7 × 3 or  oe |  |  | M1 | Allow 840 × 0.42(85...) |
|  |  |  | 360 | 2 | A1 | cao |
|  | (c) | oe e.g. , etc |  |  | M1 |  |
|  |  |  |  | 2 | A1 | cao |
|  | (d) | 8 ÷ 2 × 9 or  oe |  |  | M1 |  |
|  |  |  | 36 | 2 | A1 | cao |
|  |  |  |  |  |  | **Total 7 marks** |

| 6 | (a)(i) |  | unlikely | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | (a)(ii) |  | evens | 1 | B1 | cao |
|  | (b) (i) |  |  | 1 | B1 | or 0.083(3…) |
|  | (b) (ii) |  |  | 1 | B1oe | or 0.75 or 75% |
|  | (b) (iii) |  | 0 | 1 | B1oe | **NB**. Penalise incorrect notation once only in (b) by deducting one mark |
|  |  |  |  |  |  | **Total 5 marks** |

| 7 | (a) |  | (−2, 4) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | point plotted | 1 | B1 | Unambiguous |
|  | (c) |  | *x* = 3 drawn | 1 | B1 | Minimum 2 cm long |
|  |  |  |  |  |  | **Total 3 marks** |

| 8 | (a) | 11 × 18 (=198) **or** 10 × 11 (=110) **or** 18 × 5 (=90) **or** 5 × 8 (=40) **or** 10 × 6 (=60) **or** 6 × 8 (=48) |  |  | M1 | method to find area of any rectangle |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 11 × 18 – 8 × 6 **or** 10 × 11 + 8 × 5 **or**  18 × 5 + 10 × 6 |  |  | M1 | complete method |
|  |  |  | 150 | 3 | A1 | cao |
|  | (b) | 9 × 5 (=45) **or** 9×5×*h* = 360 **or** 360÷9(=40) **or** 360÷5(=72) |  |  | M1 | As part of working |
|  |  | 360 ÷ (9×5) **or** “40”÷5 **or** “72”÷9 |  |  | M1 | (dep) |
|  |  |  | 8 | 3 | A1 | cao |
|  |  |  |  |  |  | **Total 6 marks** |

| 9 | (a) | 2 × (−3)2 – 7×(−3) oe e.g. 2(9) –(−21)or 2×9 + 21 or 18 + 21 |  |  | M1 | Brackets must be round (−3)² |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 39 | 2 | A1 |  |
|  | (b) | 4*x* + 12 = 9*x* – 10 or oe |  |  | M1 | for 4*x* + 12 (may not be in an equation) or for dividing RHS by 4 |
|  |  | 12 + 10 = 9*x* – 4*x* or −9*x* + 4*x* = −12 −10 or 22 = 5*x* or −5*x* = −22 or 3 + 2.5 = 2.25*x* – *x* or 1.25*x* = 5.5 |  |  | M1 | (ft from 4*x* + b = 9*x* + 10)  for all terms in *x* isolated on one side and numbers on other side |
|  |  |  | 4.4 | 3 | A1 | for 4.4 oe eg.  ,  dep on at least M1 |
|  | (c) |  | −1, 0, 1, 2, 3 | 2 | B2 | B1 for −2, −1, 0, 1, 2 or list with one error or omission: e.g. −2, −1, 0, 1, 2, 3 **;** −1, 0, 1, 2 ;  −1, 1, 2, 3, etc |
|  |  |  |  |  |  | **Total 7 marks** |

| 10 | (a) | 250 × 97 |  |  | M1 | Completely correct method or figures 2425(0), e.g. 242.5 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 24 250 | 2 | A1 |  |
|  | (b) | 4 × 500 (=2000) or 500 ÷ 93.5 (=5.34759…) |  |  | M1 |  |
|  |  | “4 × 500” ÷ 93.5 or “5.34..” × 4 |  |  | M1 |  |
|  |  |  | 21 | 3 | A1 | 21 – 21.4 |
|  |  |  |  |  |  | **Total 5 marks** |

| 11 |  | or |  |  | M1 | or for (−1.5 , *y*) or (*x*, 7) or (7, −1.5) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | (−1.5 , 7) | 2 | A1 | oe |
|  |  |  |  |  |  | **Total 2 marks** |

| 12 | (a) | 20 × 0.3 |  |  | M1 | Or for an answer of | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 6 | 2 | A1 | condone ‘6 out of 20’ | |
|  | (b) | 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** | |

| 13 |  |  | *T* = 6*m* + 9*g* | 3 | B3 | Or *T* = 3(2*m* + 3*g*) [award B2 if *T* = 6*m* + 9*g* is incorrectly simplified](condone *T* = 6×*m* + 9×*g*)  if not B3 then  B2 for *T* = 6*m* + *kg* **or** *T* =*km* + 9*g* (*k* may be zero) **or** 6*m* + 9*g*  if not B2 then  B1 for 6*m* **or** 9*g* **or** *T* = *am* + *bg* (where *a* ≠ 0 or 6and *b* ≠ 0 or 9) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 3 marks** |

| 14 | (a) (i) |  | 5, 15 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (ii) |  | 5, 7, 9, 10, 11, 13, 15 | 1 | B1 |  |
|  | (b) |  | 4, 6, 8, 10, 12, 14 | 2 | B2 | B2 for all correct and none incorrect.  If not B2 then B1 for 4 or more correct and no more than 1 incorrect. |
|  |  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question** | | **Working** | **Answer** | **Mark** | **AO** | **Notes** | |
| **15** |  | 2 × 2 × 5 or 2 × 3 × 5 or 3 × 3 × 5 |  |  | AO1 | M1 | for one of 20, 30, 45 written as product of prime factors or |
|  |  | or two of |  |  |  |  | list of at least 3 multiples of any two of 20, 30, 45 |
|  |  | 20, 40, 60 … |  |  |  |  |  |
|  |  | 30, 60, 90 … |  |  |  |  |  |
|  |  | 45, 90, 105 |  |  |  |  |  |
|  |  | 2 × 2 × 5 and 2 × 3 × 5 and 3 × 3 × 5 |  |  |  | M1 |  |
|  |  | or all of |  |  |  |  |  |
|  |  | 20, 40, 60 , 80 … 180 |  |  |  |  |  |
|  |  | 30, 60, 90 … 180 |  |  |  |  |  |
|  |  | 45, 90, 105 … 180 |  |  |  |  |  |
|  |  |  | 180 | 3 |  | A1 | for 180 or 2 × 2 × 3 × 3 × 5 oe |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **16** | (a) |  |  | 2 | M1 4*n* + *k* (*k* may be zero) |
|  |  |  | 4*n* + 1 | A1 oe eg. 5 + (*n* – 1)×4  **NB: *n* = 4*n* + 1 oe scores M1 A0** |
|  | (b) |  | 4*n* + 5 | 1 | B1 ft from (a) if (a) is of the form 4*n* + *k* oe  **NB: Accept 4(*n* +1) + 1 oe** |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question** | | **Working** | **Answer** | **Mark** | **AO** | **Notes** | |
| **17** | **a** |  | triangle with  vertices | 1 | AO2 | B1 |  |
|  |  |  | (3, −1) (3, −4) (5, −4) |  |  |  |  |
|  | **b** |  | Rotation |  | AO2 | B1 |  |
|  |  |  | centre (−3, 0) |  |  | B1 |  |
|  |  |  | 90° anticlockwise | 3 |  | B1 | accept +90°, 270° clockwise, −270° |
|  |  |  |  |  |  |  | NB. If more than one transformation then no marks can be  awarded |

| 18 |  | 180 – 156 (=24) or 180(*n* – 2) = 156*n* oe or 90(2*n* – 4) = 156*n* oe |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 360 ÷ “24” or (180 × 2) ÷ (180 – 156) or |  |  | M1 | complete method |
|  |  |  | 15 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 19 |  | 420 ÷ (4 + 5 + 3) (=35)[or Manu = 140 or Liam = 175] |  |  | M1 |  | M2 for |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | “35” × 3 (=105) |  |  | M1 | or Ned = 105 | oe |
|  |  | oe |  |  | M1 |  | |
|  |  |  | 43 | 4 | A1 | 42.85 – 43 | |
|  |  |  |  |  |  | **Total 4 marks** | |

| 20 |  | e.g.4*x* = 16 or −20*y* = 40 or 20*y* = −40 or 3(14 + 5*y*) + 5y = 2 |  |  | M1 | First stage of method to eliminate one variable – allow one error only in multiplication |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | eg. 3 × 4 + 5*y* = 2 or 3*x* + 5 × −2 = 2 |  |  | M1 | (dep on M1) method to find second variable |
|  |  |  | 4, − 2 | 3 | A1 | for both 4 and −2  dep on at least M1 |
|  |  |  |  |  |  | **Total 3 marks** |

| **21** | (a) | *y*2 + 10*y* − 2*y* − 20 |  | 2 | M1 | for 3 correct terms out of 4  or for 4 correct terms ignoring signs  or for *y*2 + 8*y* + *c* for any non-zero value of *c*  or for ... + 8*y* − 20 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | *y*2 + 8*y* − 20 |  | A1 | cao |
|  | (b) |  | 4*e*2*f*(5*e3f –* 4) | 2 | B2 | B1 for a correct but incomplete factorised answer with a minimum of 2 out of **4**, ***e*2** or ***f*** outside the bracket, ie  4*e*² (5*e*3*f*2 −4*f*), 4*f*(5*e*5*f* −4*e*2), *e*²*f*(20*e*3*f* – 16),  4*ef*(5*e*4*f* – 4*e*), 2e2f(10e3f – 8)  **or** 4*e*2*f*(a two term algebraic expression) |
|  |  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 22 | 85 x 2 x 36.6 (=6222)  “4208.35..” + “6222” (=10430.35..) | 10400 | 4 | M1 or x 36.62 ÷ 2 (=2104.17..)  M1  M1 dep on both previous method marks  A1 awrt 10400  (accept correct answers given in an alternative form eg. 1.04 × 104 ; 104 × 102)  **SC**: B2 for an awrt 7320 |
|  |  | |  | **Total 4 marks** |

| 23 |  | 0.82*x* = 25.83 or 82% = 25.83 |  | 3 | M1 | or for use of 0.82 in a calculation |
| --- | --- | --- | --- | --- | --- | --- |
| or × 100 |  |  | M1 |  |
|  | 31.5(0) |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |