| Qn |  | **Working** | **Answer** | **Marks** | **Notes** |
| --- | --- | --- | --- | --- | --- |
| 1 |  | eg 20 ÷ 2.5 (= 8) **or** 32 ÷ 4 (= 8) **or** 20 ÷ 10 (= 2) **or** 32 ÷ 16 (= 2) |  |  | M1 | for a method to find a key |
|  |  |  | 8 |  | A1 | key completed correctly |
|  |  | eg 24 ÷ [their 8] **or** 14 ÷ [their 8] **or** 24 ÷ [their 2] **or** 14 ÷ [their 2] |  |  | M1 | complete method to find the picture for Miss Okoye **or** Dr Syed |
|  |  |  | Miss Okoye Dr Syed | 4 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 2 | a | 5 − 9 |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | −4 | 2 | A1 |  |
|  | bi |  | 4 | 1 | B1 |  |
|  | bii | −7, −6, −5, −1, 0, 4, 4 |  |  | M1 | for writing the values in the correct order, condone one error or omission **or** for an answer of 0 |
|  |  |  | −1 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 3 | (a) |  |    | 1 | B1oe |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |   | 1 | B1oe | eg   |
|  | (c) |  |   | 1 | B1oe  | eg   |
|  | (d) |  | 0.4 | 1 | B1 | Accept 0.40 |
|  | (e) |  | 3.555, 3.61, 3.7, 3.82, 3.9 | 1 | B1 |  |
|  |  |  |  |  |  | Total 5 marks |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **4**  |  |  | CO, CM, CW, EO, EM, EW, TO, TM, TW | 2 | B2 for all combinations with no repeats or incorrect combinationsIf not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations) |
|  |  |  |  | **Total 2 marks** |

| 5 | a |  | 8632 | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | 24 | 1 | B1 | cao |
|  | c |  | 17 | 1 | B1 | cao |
|  |  |  |  |  |  | **Total 3 marks** |

| 6 |  | (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) | Correct line between *x* = −2 and *x* = 4 | 3 | B3B2B1 | for a correct line between *x* = −2 and *x* = 4for a correct straight line segment through at least 3 of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) **OR** for all of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) plotted but not joined **OR** for a line drawn with a positive gradient through (0, 2) and clear intention to use a gradient of 3for at least 2 correct points stated (may be in a table) **OR** for a line drawn with a positive gradient through (0, 2) **OR** for a line with a gradient of 3 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 3 marks** |

| 7 | a |  | 15*rt* | 1 | B1 | oe |
| --- | --- | --- | --- | --- | --- | --- |
|  | b | eg (*x* = ) (27 – 5) ÷ 4  |  |  | M1 | complete method |
|  |  |  | 5.5 | 2 | A1 | oe |
|  | c | 7 × 2 – 5 × 4 |  |  | M1 |  |
|  |  |  | −6 | 2 | A1 |  |
|  | d | 2 × (–3)2 – 5 |  |  | M1 |  |
|  |  |  | 13 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 7 marks** |
|  |  |  |  |  |  |  |

| 8 | (a) |  | (2, 3) | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b)  |  | (−3, −1) | 1 | B1 |  |
|  | (c)  |  | (−0.5, 1) | 2 | B2 | B1 for (−0.5, *y*) or (*x*, 1) or (1, −0.5) |
|  |  |  |  |  |  | **Total 4 marks** |

| 9 | (a)  |  | 70 216 | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 1, 2, 5 or 10 | 1 | B1 | Any of these values with no other incorrect value |
|  | (c) |  | 25 or 36 | 1 | B1 | One or both of 25 or 36 and no other incorrect value |
|  | (d) |  | 15 | 1 | B1 |  |
|  | (e) |  | 42 – 6 ÷ (6 – 3) | 1 | B1 | Allow 42 – (6 ÷ (6 – 3)) |
|  |  |  |  |  |  | Total 5 marks |

| 10 | a |  | Kite drawn | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | Octagon | 1 | B1 |  |
|  | ci |  | Cuboid | 1 | B1 |  |
|  | cii |  | 8 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 11 | (a) |  | Frequencies and tallies of 2, 3, 8, 4, 5, 2 | 2 | B2 | All frequencies and tallies correctB1 for 3, 4 or 5 frequencies or tallies correctNB. Frequencies and tallies must be in the correct column. Accept 2/24 etc. in frequency column |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 3 | 1 | B1ft | Follow through from table |
|  | (c) |  | Sensible statement | 1 | B1 | Not enough 1’s or 6’sToo many 3’sRolled a 3 a third of the timesShould expect to get 4 of each number |
|  |  |  |  |  |  | **Total 4 marks** |

| 12 | (a) |  | 4*k* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) (i) |  | 94 | 1 | B1 |  |
|  |  (ii) |  | 38 | 1 | B1 |  |
|  | (c) |  | 519 | 1 | B1 |  |
|  | (d) |  |  | 2 | M1  | A factor tree / division ladder of 3 or more factors (≠1), multiplying to 800, which must include 2 and 5. Condone 1 error when product ≠ 800 |
|  |  |  | 2×2×2×2×2×5×5 |  | A1 | Dep on M1 oe eg 25 × 52  |
|  |  |  |  |  |  | **Total 6 marks** |

| 13 | a | e.g.    |  |  | M1 | for a correct first step e.g. subtract *g* from both sides **OR** divide all terms by 2 **OR** divide all terms by *c* **OR** divide all terms by 2*c* |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |   | 2 | A1 | oe |
|  | b |  | 3*f* (3*e* – 4) | 2 | B2 | (B1 for 3(3*ef* – 4*f*)or *f*(9*e* −12) or 3*f*(*ke* – 4) or 3*f*(3*e* – *m*) where *k* ≠ 0 and *m* ≠ 0) |
|  | c | *x*2 – 5*x* + 2*x* − 10 |  |  | M1 | for any 3 correct terms **or** for 4 out of 4 correct terms ignoring signs **or** *x*2 – 3*x*… **or** for …−3*x* − 10 |
|  |  |  | *x*2 – 3*x* − 10 | 2 | A1 |  |
|  | d |  **OR** *n*−1 × *n*7 **OR** *n*4 × *n*2 **OR** *n*4 × *n*7 ×*n*−5 **OR**  *n*”11” ÷ *n*5 = *n*(”11” – 5) |  |  | M1 | for simplifying two terms |
|  |  |  | *n*6 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 8 marks** |

| 14 | (a) |  | 3*e*² − 5*e* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 5(7 + *f*) | 1 | B1 |  |
|  | (c) |  | 64*p*³*q*6 | 2 | B2 | B1 for 2 correct parts of the product |
|  |  |  |  |  |  | **Total 4 marks** |

| 15 |  |  | −1, 0, 1, 2, 3, 4 | 2 | B2 | B1 for – 2, −1, 0, 1, 2, 3, 4 or −1, 0, 1, 2, 3 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

| 16 | a |  | Rotation |  | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | (0, 0) |  | B1 | or *O* or origin |
|  |  |  | 90° clockwise | 3 | B1 | NB award no marks if more than one transformation is described |
|  | b |  | Shape **R** in correct position | 2 | B2B1 | Vertices at (−4, 1) (−4, 4) (−5, 4) (−5, 2) (−6, 2) (−6, 1)for a correct reflection in the line *x* = *k* where *k* ≠ −1 **OR** at least 4 vertices in the correct position  |
|  |  |  |  |  |  | **Total 5 marks** |

| 17 |  | e.g.  **and**  oe |  |  | M1 | both fractions expressed as improper fractions |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g.  **OR**  oe |  |  | M1 | correct cancelling **OR** multiplication of numerators and denominators without cancelling |
|  |  | e.g. **or** **or** **or** candidate clearly shows that in the question, the result of  and that their answer becomes   | shown | 3 | A1 | Dep on M2 for conclusion to  from correct working – either sight of the result of the multiplication e.g.  must be seen or correct cancelling prior to the multiplication to  NB: use of decimals scores no marks |
|  |  |  |  |  |  | **Total 3 marks** |

| 18 |  | (adding) 10*x* = – 5 or 21*x* + 35*y* = 42 21*x* – 15*y* = – 33  then 50*y =* 75 |  | 3 | M1 | Correct method to eliminate *x* or *y*: coefficients of *x* or *y* the same **and** correct operator to eliminate selected variableor correct substitution for *x* or *y* into 2nd equation  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | *x* = −0.5 oe*y* = 1.5 oe |  | A1 A1 | Both A marks dep on M1 |
|  |  |  |  |  |  | **Total 3 marks** |

| 19 |  | (*x* ± 9)(*x* ± 4) | **or**  |  |  | M1 | **or** (*x* + *a*)(*x* + *b*) where *ab* = −36 **or** *a* + *b* = −5 **OR** correct substitution into quadratic formula (condone one sign error in *a*, *b* or *c*)(if + rather than ± shown then award M1 only unless recovered with answers) |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | (*x* − 9)(*x* + 4) |  **or**  |  |  | M1 | **or**  **or**   |
|  |  |  | 9, −4 | 3 | A1 | dep on at least M1 |
|  |  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Qn** | **Paper** | **Question** | **Skill tested** | **Mean score** | **Max score** | **Mean %** | **ALL** | **5** | **4** | **3** | **2** | **1** |
| **1** | **1FR** | Q05 | Graphical representation of data | 3.70 | 4 | 93 | 3.70 | 3.96 | 3.74 | 3.75 | 3.58 | 3.12 |
| **2** | **1FR** | Q02 | Statistical measures | 4.36 | 5 | 87 | 4.36 | 4.74 | 4.57 | 4.23 | 3.80 | 4.13 |
| **3** | **2FR** | Q04 | Fractions and decimals | 4.39 | 5 | 88 | 4.39 | 4.84 | 4.52 | 4.35 | 3.89 | 3.00 |
| **4** | **1FR** | Q05 | Representation of data | 1.77 | 2 | 89 | 1.77 | 1.95 | 1.92 | 1.85 | 1.77 | 1.28 |
| **5** | **1FR** | Q01 | Integers | 2.51 | 3 | 84 | 2.51 | 2.76 | 2.56 | 2.51 | 2.27 | 1.87 |
| **6** | **1FR** | Q11 | Graphs | 2.06 | 3 | 69 | 2.06 | 2.91 | 2.48 | 1.94 | 0.88 | 0.38 |
| **7** | **1FR** | Q06 | Expressions and formulae | 5.14 | 7 | 73 | 5.14 | 6.39 | 5.73 | 4.84 | 3.69 | 2.38 |
| **8** | **2FR** | Q07 | Graphs | 2.97 | 4 | 74 | 2.97 | 3.54 | 3.18 | 2.81 | 2.44 | 1.33 |
| **9** | **2FR** | Q01 | Powers and roots | 3.60 | 5 | 72 | 3.60 | 4.42 | 3.92 | 3.38 | 2.56 | 1.16 |
| **10** | **1FR** | Q03 | 3D shapes and volume | 2.91 | 4 | 73 | 2.91 | 3.36 | 3.12 | 2.88 | 2.39 | 1.38 |
| **11** | **2FR** | Q02 | Statistical measures | 2.64 | 4 | 66 | 2.64 | 2.93 | 2.81 | 2.42 | 2.37 | 2.51 |
| **12** | **2FR** | Q12 | Powers and roots | 3.72 | 6 | 62 | 3.72 | 5.34 | 4.19 | 3.05 | 2.14 | 1.16 |
| **13** | **1FR** | Q16 | Algebraic manipulation | 4.24 | 8 | 53 | 4.24 | 7.15 | 5.10 | 3.06 | 1.31 | 1.26 |
| **14** | **2FR** | Q18 | Algebraic manipulation | 2.03 | 4 | 51 | 2.03 | 3.19 | 2.30 | 1.59 | 0.81 | 0.17 |
| **15** | **2FR** | Q25a | Inequalities | 0.97 | 2 | 49 | 0.97 | 1.59 | 1.06 | 0.70 | 0.44 | 0.00 |
| **16** | **1FR** | Q13 | Transformation geometry | 2.10 | 5 | 42 | 2.10 | 3.43 | 2.46 | 1.56 | 1.00 | 0.38 |
| **17** | **1FR** | Q15 | Fractions | 1.26 | 3 | 42 | 1.26 | 2.28 | 1.30 | 1.06 | 0.23 | 0.38 |
| **18** | **2FR** | Q21 | Simultaneous linear equations | 1.12 | 3 | 37 | 1.12 | 2.46 | 1.21 | 0.51 | 0.07 | 0.00 |
| **19** | **1FR** | Q20 | Quadratic equations | 0.76 | 3 | 25 | 0.76 | 1.67 | 0.93 | 0.26 | 0.08 | 0.12 |
|  |  |  |  | **52.25** | **80** | **65** | **52.25** | **68.91** | **57.10** | **46.75** | **35.72** | **26.01** |

**Suggested grade boundaries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grade** | **5** | **4** | **3** | **2** | **1** |
| Mark | 63 | 52 | 41 | 31 | 20 |