|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Working** | **Answer** | **Mark** | **Notes** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **1**  |  |  | 0.25 | 1 | B1 |
|  |  |  |  |  |  | ***Total 1 mark*** |

| 2 | (i) |  | 13 or 23 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (ii) |  | 36 | 1 | B1 |  |
|  | (iii) |  | 14 | 1 | B1 |  |
|  |  |  |  |  |  | ***Total 3 marks*** |

| 3 | (a) |  | 10*ab* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3 | (b) |  | 4 | 1 | B1 |  |
|  |  |  |  |  |  | ***Total 2 marks*** |

| 4 | (a) |  | −4, (−1), 2, (5), 8, 11, (14), 17 | 2 | B2 | for −4, 2, 8, 11, 17 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | (B1 | for 3 or 4 correct values) |
|  | (b) |  |  | 2 | M1 | (may ft from (a) if B1 awarded) for at least 5 points correctly plotted – if no plots, use points at which graph crosses squares or M1  |
|  |  |  | Graph drawn |  | A1 | for correct graph drawn from *x* = −1 to *x* = 6 |
|  |  |  |  |  |  | ***Total 4 marks*** |

| 5 | (a)  |  | An acute angle drawn at *A* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | Diameter drawn | 1 | B1 | Diameter should not extend significantly beyond circumference. |
|  |  |  |  |  |  | **Total 2 marks** |

| 6 | (a) |  | BG, BO, BP, RG, RO, RP, YG, YO, YP | 2 | B2 | all 9 combinations given with no extras or repeats |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | (B1) | at least 5 correct combinations given, condone repeats and incorrect combinations |
|  (b) |  |   | 1 | B1 | oe,ft from (a), accept 0.33(33…) |
|  | (c) |  |  |  | M1 | for  where *a* > 7 or  where *b* < 20 |
|  |  |  |  | 2 | A1 | oe |
|  |  |  |  |  |  | **Total 5 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **7**  | (a) |  | correct bar | 1 | B1 for bar drawn at correct height of 13Allow a line instead of a bar |
|  | (b) |  | Brazil | 1 | B1 |
|  | (c) | 29 |  | 2 | M1 for  with *k* > 29 **or**  with *n* < 113 oeMay work in millionsAllow incorrect notation e.g. 29 out of 113 or 29:113 oe |
|  |  |  |  |  | A1 oe Allow 0.26 or 0.256(6371…….) |
|  |  |  |  | **Total 4 marks** |

| 8 | (a)(i) |  | ˂ | 1 | B1 | for ˂ |
| --- | --- | --- | --- | --- | --- | --- |
|  | (ii) |  | ˃ | 1 | B1 | for ˃ |
|  | (b) |  | Neon | 1 | B1 | for neon |
|  | (c) |  | Mercury | 1 | B1 | for mercury |
|  |  |  |  |  |  | **Total 4 marks** |

| 9 |  |  |  | 3 | B3 | B3 for all 4 correct regionsB2 or 2 or 3 correct regionsB1 for 1 correct regions |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | ***Total 3 marks*** |

| 10 | (a) |  | 0.5, 0.501, 0.51, 0.55 |  1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  |  | 1 | B1 | for  oe eg   |
|  | (c) |  | 0.47 | 1 | B1 |  |
|  |  |  |  |  |  | ***Total 3 marks*** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **11**  | (a) |  | 11*m* – 3*k* | 2 | B2 If not B2 then award B1 for either 11*m* or −3*k* |
|  | (b)  | 2 × 5 + 3 × 8 **or** 10 + 24 |  | 2 | M1 for substituting the values of *a* and *b* into *P* |
|  |  |  | 34 |  | A1 |
|  | (c)  | 16 = 2*a* + 3 × 20 **or** 16 = 2*a* + 60  | *P* – 3*b* = 2*a* |  | 3 | M1 for substituting the values of *P* and *b* into the equation **or** rearranging the equation *P* = 2*a* + 3*b* for 2*a* correctly |
|  |  | 16 − 60 = 2*a* −44 = 2*a* oe **or**  | 16 – 2 × 30 = 2*a*  **or**16 – 60 = 2*a*   |  |  | M1 for rearranging the equation for 2*a* correctly **or** substituting the values of *P* and *b* into the correctly rearranged equation |
|  |  |  | −22 |  | A1 |
|  |  |  |  | **Total 7 marks** |

| 12 |  |  | *T* = 10*m* + 6*n* | 3 | B3 | for *T* = 10*m* + 6*n* oe  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | (B2 | for 10*m* + 6*n* or *T* = 10*m* + *an* or *T* = *bm* + 6*n* or *T* = 6*m* + 10*n*) |
|  |  |  |  |  | (B1 | for 10*m* + *an* or *bm* + 6*n* or 6*m* + 10*n*) or for *T* = an incorrect expression in *m* and *n* |
|  |  |  |  |  |  | ***Total 3 marks*** |

| 13 | (a) |  | *x*7 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | eg 78 × 74 = 712 or 78 ÷ 73 = 75 or 75 × 74 or 74 ÷ 73 = 7 or 78 × 7 or 7’12’ ÷ 73 = 7’12’−3 |  | 2 | M1 | for one correct step – must be written as a power of 7 |
|  |  |  | 79 |  | A1 | for 79 |
|  |  |  |  |  |  | ***Total 3 marks*** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **14** | (i) |  | kilometres | 1 | B1 accept m |
|  | (ii) |  | grams | 1 | B1 accept g or grammes |
|  | (iii) |  | square metres | 1 | B1 accept m2 |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **15** |  |  **or**   |  | 2 | M1 for converting to a simplified improper fraction **or** an unsimplified mixed fraction |
|  |  |  |   |  | A1 |
|  |  |  |  |  | **Total 2 marks** |

| 16 | (a) |  | 5*x* – *x*2 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 3(*y* – 7) | 1 | B1 |  |
|  | (c) | *f* + *d* = 3*p* **or**   |  | 2 | M1 | A correct first stage in a correct formula |
|  |  |  |  |  | A1 | for  (must see p =… at some stage)(SCB1 for) |
|  |  |  |  |  |  | ***Total 4 marks*** |

| 17 |  |  or   |  | 3 | M1 | for correct improper fractions or fractional part of numbers written correctly over a common denominator |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  or  or  oe |  |  | M1 | for correct fractions with a common denominator of 15 or a multiple of 15 |
|  |  | or if shows at the beginning then show that the addition comes to   | Shown |  | A1 | dep on M2 for a correct answer from fully correct working **or** shows that RHS =  **and** fully correct working shows LHS =  |
|  |  |  |  |  |  | ***Total 3 marks*** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **18** | (a) | *m*2 – 8*m* + 5*m* – 40 |  | 2 | M1 for any 3 correct terms **or** for 4 out of 4 correct terms ignoring signs  **or**for *m*2 – 3*m* … **or**for …– 3*m* – 40 |
|  |  |  | *m*2 – 3*m* – 40 |  | A1  |
|  |  |  |  |  | **Total 2 marks** |

| 19 |  |  | Rotation180° and (0, 0) | 2 | B1 | Rotation (with none of reflection, translation, enlargement, mirrored, flipped or moved stated) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | B1 | 180° centre (0, 0) or *O*(award if no vector or equation of line or SF mentioned)(B2 for enlargement SF −1 centre *O*) |
|  |  |  |  |  |  | ***Total 2 marks*** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **20** |  |  **or** E.g.  |  | 2 | M1 |
|  |  | E.g.**or****or** | Shown |  | A1 for fully correct method leading to  - this must be preceded by a correct equivalent fraction e.g.  ,  , **or** fully correct cancelling must be seen within a multiplication |
|  |  |  |  | **Total 2 marks** |

| 21 |  | 2*x* ˃ 4 – 7 **or** *x* + 3.5 > 2 |  | 2 | M1 | For a correct first step allow 2*x* = 4 – 7 or *x* + 3.5 = 2or an answer of *x* = −1.5 or *x* < −1.5 or −1.5 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | *x* ˃ −1.5 |  | A1 | for *x* ˃ −1.5 oe |
|  |  |  |  |  |  | **Total 2 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **22** |  |  | 5*y*(1 + 4*y*) | 2 | B2 If not B2 then award B1 for5(*y* + 4*y*2) **or** *y* (5 + 20*y*) **or** 5*y*(*a* + 4*y*) where *a* is an integer and *a* ≠ 0 **or** 5*y*(1 + *by*) where *b* is an integer and *b* ≠ 0 |
|  |  |  |  |  | **Total 2 marks** |

| *23* |  | Fully correct angle bisector with all relevant arcs shown | 2 | B2  | Fully correct angle bisector with all arcs shown.B1 for all arcs and no angle bisector drawn or for a correct angle bisector within guidelines but not arcs or insufficient arcs  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | ***Total 2 marks*** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **24** |  |  | Trapezium with vertices at (6, 3) (8, 3) (8, 6) (4, 6) | 2 | B2If not B2 then award B1 for shape of correct size and orientation **or** 3 or 4 points plotted correctly |
|  |  |  |  | **Total 2 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **25** |  | E.g. or oe |  | 4 | M1 for expansion of a correct bracket  |
|  |  | 2 × 3(2*x* – 5) = 9 – *x* oe **or** 2(‘6*x* – 15’) = 9 – *x* oe  **or**3(2*x* – 5) = oe |  |  | M1 for removal of fraction **or** separating fraction (RHS) in an equation |
|  |  | 12*x* + *x* = 9 + 30 oe **or**oe |  |  | M1 ft (dep on 4 terms) for terms in *x* on one side of equation; number terms on the other  |
|  |  |  | 3 |  | A1 dep on at least M2 awarded |
|  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **26** |  |  | 1 | 1 | B1 |
|  |  |  |  |  | **Total 1 mark** |

| 27 |   | (*x* ± 8)(*x* ± 5) |  **or**   |  |  | M1 | **or** (*x* + *a*)(*x* + *b*) where *ab* = −40 **or** *a* + *b* = −5 **OR** correct substitution into quadratic formula (condone one sign error in *a*, *b* or *c* and missingbrackets)(if + rather than ± shown then award M1 only unless recovered with answers) |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | (*x* − 8)(*x* + 5) |  **or**   |  |  | M1 |   **or**   |
|  |  |  | 8, −5 | 3 | A1 | dep on at least M1 for correct values |
|  |  |  |  |  |  | ***Total 3 marks*** |

| 28 |  | 32.4 × 1003 |  | 2 | M1 | for 32.4 × 1003 oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 32 400 000 |  | A1 | for 32 400 000 accept 3.24 × 107 |
|  |  |  |  |  |  | ***Total 2 marks*** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Edexcel averages: scores of candidates who achieved grade:** |
| Qn | **Paper** | **Question** | **Skill tested** | **Max score** | **Mean %** | **ALL** | **5** | **4** | **3** | **2** | **1** | **U** |
| 1 | **1F** | Q06a | Decimals | 1 | 92 | 0.92 | 0.99 | 0.99 | 0.98 | 0.93 | 0.67 | 0.45 |
| 2 | **2F** | Q01 | Integers | 3 | 94 | 2.81 | 2.98 | 2.94 | 2.89 | 2.74 | 2.38 | 1.38 |
| 3 | **2F** | Q05 | Linear equations | 2 | 92 | 1.84 | 1.96 | 1.94 | 1.93 | 1.83 | 1.43 | 0.80 |
| 4 | **2F** | Q08 | Graphs | 4 | 82 | 3.28 | 3.91 | 3.85 | 3.63 | 2.88 | 1.29 | 0.23 |
| 5 | **2FR** | Q03 | Circle properties | 2 | 80 | 1.59 | 1.91 | 1.77 | 1.52 | 1.19 | 0.34 | 0.00 |
| 6 | **1FR** | Q07 | Probability | 5 | 90 | 4.49 | 4.94 | 4.78 | 4.41 | 4.19 | 3.00 | 1.00 |
| 7 | **1F** | Q02 | Bar charts | 4 | 81 | 3.24 | 3.81 | 3.64 | 3.39 | 2.85 | 2.12 | 1.32 |
| 8 | **2F** | Q11abc | Integers | 4 | 83 | 3.31 | 3.81 | 3.60 | 3.31 | 3.11 | 2.48 | 1.55 |
| 9 | **2F** | Q16 | Set language and notation | 3 | 79 | 2.38 | 2.82 | 2.68 | 2.53 | 2.16 | 1.37 | 0.51 |
| 10 | **2F** | Q02 | Degree of accuracy | 3 | 73 | 2.18 | 2.77 | 2.56 | 2.23 | 1.78 | 1.16 | 0.44 |
| 11 | **1F** | Q08 | Expressions and formulae | 7 | 64 | 4.51 | 6.36 | 5.60 | 4.72 | 3.23 | 1.51 | 0.56 |
| 12 | **2F** | Q13d | Expressions and formulae | 3 | 58 | 1.73 | 2.65 | 2.26 | 1.74 | 1.13 | 0.28 | 0.03 |
| 13 | **2F** | Q17 | Powers and roots | 3 | 53 | 1.58 | 2.66 | 2.13 | 1.51 | 0.76 | 0.20 | 0.07 |
| 14 | **1F** | Q03a | Measures | 3 | 61 | 1.84 | 2.29 | 2.08 | 1.84 | 1.56 | 1.23 | 0.80 |
| 15 | **1F** | Q06b | Fractions | 2 | 55 | 1.09 | 1.58 | 1.27 | 1.08 | 0.79 | 0.53 | 0.16 |
| 16 | **2F** | Q13abc | Expressions and formulae | 4 | 47 | 1.87 | 3.44 | 2.49 | 1.68 | 0.82 | 0.24 | 0.02 |
| 17 | **2F** | Q19 | Fractions | 3 | 43 | 1.28 | 2.53 | 1.75 | 1.04 | 0.47 | 0.18 | 0.07 |
| 18 | **1F** | Q21a | Algebraic manipulation | 2 | 44 | 0.87 | 1.67 | 1.16 | 0.78 | 0.36 | 0.11 | 0.02 |
| 19 | **2F** | Q14 | Transformation geometry | 2 | 44 | 0.88 | 1.44 | 1.13 | 0.84 | 0.53 | 0.17 | 0.04 |
| 20 | **1F** | Q06c | Fractions | 2 | 37 | 0.74 | 1.41 | 0.94 | 0.67 | 0.35 | 0.15 | 0.07 |
| 21 | **2F** | Q23a | Inequalities | 2 | 33 | 0.65 | 1.39 | 0.90 | 0.48 | 0.21 | 0.05 | 0.00 |
| 22 | **1F** | Q21b | Algebraic manipulation | 2 | 30 | 0.60 | 1.32 | 0.80 | 0.48 | 0.20 | 0.04 | 0.00 |
| 23 | **2F** | Q21 | Construction | 2 | 29 | 0.58 | 1.23 | 0.75 | 0.45 | 0.22 | 0.09 | 0.03 |
| 24 | **1F** | Q19 | Transformation geometry | 2 | 26 | 0.51 | 1.23 | 0.70 | 0.34 | 0.08 | 0.05 | 0.00 |
| 25 | **1F** | Q21d | Linear equations | 4 | 24 | 0.94 | 2.10 | 1.13 | 0.75 | 0.38 | 0.13 | 0.02 |
| 26 | **1F** | Q21c | Powers and roots | 1 | 16 | 0.16 | 0.39 | 0.20 | 0.09 | 0.04 | 0.04 | 0.03 |
| 27 | **2F** | Q23b | Quadratic equations | 3 | 14 | 0.41 | 1.20 | 0.47 | 0.21 | 0.05 | 0.00 | 0.00 |
| 28 | **2F** | Q18 | Measures | 2 | 3 | 0.06 | 0.20 | 0.05 | 0.02 | 0.02 | 0.00 | 0.00 |
|  |  |  | **TOTAL** | **80** | **58** | **46.34** | **64.99** | **54.56** | **45.54** | **34.86** | **21.24** | **9.60** |

**Suggested grade boundaries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grade** | **5** | **4** | **3** | **2** | **1** |
| Mark | 60 | 50 | 40 | 29 | 16 |