|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2a** |  | 10 | 1 | B1 |  |
| b |  | 30 | 1 | B1 |  |
| c |  | 40 | 1 | B1 |  |
| d |  | 0.6(0) | 1 | B1 |  |
| e |  |  | 2 | M1 oe |  |
|  |  |  |  | A1 |  |
|  |  |  |  |  | **Total 6 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **4a** |  | Obtuse | 1 | B1 |  |
| b |  | 60 | 1 | B1 |  |
| c |  | Trapezium | 1 | B1 |  |
|  |  |  |  |  |  |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **5a** |  | 9 | 1 | B1 |  |
| b |  | 21 | 1 | B1 |  |
| c |  | Explanation | 1 | B1 | e.g all the terms are odd and 150 is even **or** 149 is in the sequence **or** 4*n* + 1 = 150 does not have an integer answer |
|  |  |  |  |  |  |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **6a** |  | (−3, −2) | 1 | B1 |  |
| b |  | Plotted | 1 | B1 |  |
| c |  | Suitable point | 2 | B2 | for e.g (3, −2), (−3, 4)(B1 for *C* plotted correctly but coordinates written incorrectly) |
|  |  |  |  |  |  |
|  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **10a** |  | 3 | 1 | B1 |  |
| b |  | 5 |  | M1 | or for 8 × 2*t* **or** 80 ÷ 8 **or** 80 ÷ 2 |
|  |  |  |  | A1 |  |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **11a** |  | 17 or 19 | 1 | B1 | for either or both |
| b |  | 2, 23 | 1 | B1 |  |
| c  | (60 − 2) ÷ 2 | 29, 31 | 2 | M1 | any complete method |
|  |  |  |  | A1 |  |
|  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **12** | 5*x* – *x* = 8 – 10 |  |  | M1 | for correct rearrangement with *x* terms on one side and numbers on the other in a correct equation **or**the correct simplification of either *x* terms or numbers on one side in a correct equationeg. 4*x* − 8 = −10 ; 5*x* = *x* – 2 |
|  | 4*x*  = −2 |  |  | M1 | or –4*x* = 2 **or** 4*x* + 2 = 0  **or** −4*x* – 2 = 0NB: This mark implies the previous M1 |
|  |  | −0.5 | 3 | A1 | oe e.g.  dep on M1 |
|  |  |  |  |  | **Total 3 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **14a** | π × 2.5 oe **or** 2 × *π* ×   |  |  | M1 |  |
|  |  | 7.85 | 2 | A1 | 7.85 – 7.86 |
| b |  oe **or** oe |  |  | M1 | or for digits 188 |
|  |  | 18.8 | 2 | A1 | accept 19 if 18.8 seen |
|  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **16** | e.g. 2 × 2 × 7 × 12 **or**at least 3 divisions in a factor tree |  |  | M1 | for the start of a correct method e.g. may be a factor tree **or** consecutive divisionscondone 1 error |
|  | All 6 correct prime factors, no extras (2,2,2,2,3,7,(1)) |  |  | M1 | e.g. from a factor tree, ignore 1s |
|  |  | 2×2×2×2×3×7 | 3 | A1 | oe dep on M1, M1 |
|  |  |  |  |  | **Total 3 marks** |

| 18 |  | 12.8² $–$ 9.7² or 163.84 $–$ 94.09 or 69.75  |  | 3 | M1 | For squaring and subtracting[ **and**  ]  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1dep  | For square root [ ] |
|  |  |  | 8.35 |  | A1 | Allow 8.35 - 8.352 |
|  |  |  |  |  |  | **Total 3 marks** |

| **Q** | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| **19** |  |  or  | 45 | 2 | M1A1  | For complete correct method for exterior angleDo not isw interior angle found |
|  |  |  |  |  |  | **Total 2 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **20a** |  | Correct triangle(−1, −2) (−1, 0) (2, −2) |  | 2 | B2(B1 for a rotation of 90o clockwise about a different centrei.e. a triangle in the same orientation as the correct triangle **or**rotation by 90o anticlockwise about (0, 2)) |
| **b** |  | Correct trapezium(1, −1) (1, −2) (3, 1) (3, −2) |  | 1 | B1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **c** |  | Vertices at (3, 2) (3, 4) (4, 4) (4, 3) | 2 | B2 If not B2 then B1 for shape of correct size and orientation **OR** a correct enlargement scale factor  , centre (1, 3) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **Total 5 marks** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **21a** |  |  | 2 | B2 | If not B2 then award B1 for *a*, *b* ≠ 0 |
| b |  | (*x* − 6)(*x* + 1) | 2 | B2 | If not B2 then award B1 for  (*x* – 1)(*x* + 6) **or** (*x* – 3)(*x* – 2) **or** (*x* + 3)(*x* – 2) **or** (*x* – 3)(*x* + 2) |
|  |  |  |  |  | **Total 4 marks** |

| 22 | a |  | 0.00079 | 1 | B1 | cao |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  |  | 2 | M1 | for 20.15 × 109 **or** 20 150 000 000 or 2.015 × 10*n* where *n* ≠ 10 |
|  |  |  | 2.015 × 1010 |  | A1 | For 2 × 1010 or better |
|  |  |  |  |  |  | **Total 3 marks** |

| 23 |  | 4*x* ≥ 27 – 13 or  or –4*x* ≤ 13 – 27 or  |    | 2 | M1A1 | Accept an equation in place of an inequality orAccept wrong inequality sign orAccept 3.5 oe given as answeroeMust be the final answer |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **25a** | 100 − 9.4 (= 90.6) |  |  |  | M1 |  |
|  |  oe | 607 – “57.058” |  |  | M1 |  (dep) |
|  |  | 550 | 3 | A1 | for 549.942 **or** 549.94 **or**  549.9 |
| b | oe |  |  | M2 | for a complete methodIf not M2 then award M1 for a correct first step1320 ÷ 20 (=66) **or** 0.2*x* = 1320 **or**1320 ÷ 2 (=660) |
|  |  | 6600 | 3 | A1 |  |
|  |  |  |  |  | **Total 6 marks** |