| Question | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| 1 | (a) |  | 44 | 1 | B1 |  |
| (b) |  | 6 | 1 | B1 |  |
| (c) |  | 36 | 1 | B1 |  |
| (d) |  | 17 | 1 | B1 |  |
| (e) |  | 8, 76 | 1 | B1 | Must have both and no others |
|  |  |  |  |  |  | **Total 5 marks** |

| 3 | (a) |  | 14 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
| (b) |  | −19 | 1 | B1 |  |
|  |  |  |  |  |  | **Total 2 marks** |

| 4 | (a) | 0.3 × 30 (= 9) **or**  **or** **or** 0.333…+ 0.3(=0.63…) **or** 33.3…(%) + 30(%)oe (=63.3…)(%) |  | 3 | M1 | Allow 9 squares clearly indicated for 30% or 10 squares clearly indicated for  |
| --- | --- | --- | --- | --- | --- | --- |
|  | “9” and “10” or 19 shaded squares on diagram**or**  **or**  (1 – 0.63…)× 30 |  | M1 | Allow squares with crosses or other indication of ‘shading’ such as ‘*y*’ or ‘*b*’ |
|  |  | 11 | A1 |  |
| (b) | eg 76% (25%) 7.66% (8%) 2.6% or(0.76) 0.25 (0.0766) 0.08 (0.026) | 0.026, 0.0766, 8%, 25%, 0.76 | 2 | M1 | All values written as % or all written as decimals or 4 values in correct order or all values in correct reverse order |
|  | A1 | Any form |
|  |  |  |  |  |  | **Total 5 marks** |

| 7 | (a) |  | 6*p* | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
| (b) |  | 8*y*² | 1 | B1 |  |
| (c) |  | *e*5 | 1 | B1 |  |
| (d) |  | 20*cd* | 1 | B1 |  |
| (e) |  | 26 | 1 | B1 |  |
| (f) | 424 = 4*n* | 106 | 2 | M1 | For 424 or 324 + 225 –125 with at most one error |
|  |  | A1 | SCB1 for 524 or 674 |
| (g) |  | 3(3*t* – 2) | 1 | B1 |  |
|  |  |  |  |  |  | **Total 8 marks** |

| 10 |  | 4*x* + 6*x* + 11 + 9*x* – 18 = 126 oe eg19*x* – 7 = 126 oreg (126 + 18 – 11) ÷ 19 |  | 4 | M1 | A correct equation or a correct calculation for *x* |
| --- | --- | --- | --- | --- | --- | --- |
|  | *x* = 7 |  | A1 |  |
|  | 0.5 × (9 × “7” – 18) × (4 × “7”)(0.5 × 45 × 28) |  | M1 | Dep on M1 |
|  |  | 630 | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 11 |  | *ABD* = 180 – 143 (= 37) **or** *AEJ* = 76 **or***CED* = 76 **or** *ECD* = 180 – 143 ( = 37) |  | 3 | M1 | may be marked on diagram |
| --- | --- | --- | --- | --- | --- | --- |
|  | 180 – 76 – “37” |  | M1 | A correct calculation for *EDC* |
|  |  | 67 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 17 | (a) | 520 – 465 (= 55) **or** (=1.118…) | 11.8 | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  **or** 100 ×(“1.118” – 1) oe | M1 |  |
|  |  | A1 | 11.8 or better (11.827956...) |
| (b) | 0.12 × 550 (= 66) | 484 | 3 | M1 oe |  | M2 for 0.88 × 550 |
|  | 550 – “66” | M1 |  |
|  |  | A1 |  |
|  |  |  |  |  |  | **Total 6 marks** |

| 18 | (a)(i) |  | Correct line | 1 | B1 | For *x* = 1.5 drawn |
| --- | --- | --- | --- | --- | --- | --- |
|  (ii) | Correct line | 1 | B1 | For *y* = *x* drawn |
|  (iii) | Correct line | 1 | B1 | For *x* + *y* = 6 drawn |
| (b) |  | Correct region | 1 | B1 | dep on B3 for correctly shading the region **R**accept unlabelled or unshaded if clear. Shading can be ‘in’ or ‘out’. |
|  |  |  |  |  |  | **Total 4 marks** |

| 19 | (a) | 8*x*² + 20*x* – 6*x*² + 9*x* | 2*x*² + 29*x* | 2 | M1 | 3 correct terms or all 4 terms condoning incorrect signs |
| --- | --- | --- | --- | --- | --- | --- |
|  | A1 |  |
| (b) |  or or 5 + *n* ˗ 6 = 13 | 14 | 2 | M1 | Use of 1 rule of indices or a correct equation in *n* |
|  | A1 | Accept  |
| (c)(i) | 7*t* – 2*t* < 7 + 8 oe eg 5*t* < 15 oe | *t* < 3 | 2 | M1 | Terms in *t* on one side and number terms the other side – may be in an equation or the incorrect inequality sign or an answer of *t* = 3 or eg *t* ≥ 3 |
|  |  | A1 | Must be a correct inequality given as answer |
|  (ii) |  | open circle at *t* = 3 and a line with an arrow to the left | 1 | B1ft | Allow a line without an arrow if it reaches to at least −5, with an arrow it can be any length |
|  |  |  |  |  |  | **Total 7 marks** |

| 20 | (a) |  | 1 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
| (b) | oe |  | 3 | M1 |  |
|  | 32 × 10124 **or** 3 × 10125 + 0.2 × 10125 **or** 30 × 10124 + 2 × 10124 |  | M1 | oe ‘correct’ answer in incorrect form. |
|  |  | 3.2 × 10125 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 22 |  | 8² + 15² (= 289) | 167 | 5 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | M1 |  |
|  |  |  **or** 0.5 × 15 × 8 (= 60) | M1 |  |
|  |  |  – 0.5 × 15 × 8 ( “226.98” – “60”) | M1 |  |
|  |  |  | A1 | Accept answers which round to 167 |
|  |  |  |  |  |  | **Total 5 marks** |

| 23 |  |  |  | 2 | B2 | (B1 for 12 870 000 or correct unsimplified product or  with at least 1 of *m*, *n* or *p* correct or for) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Total 2 marks** |