| 1 |  | E.g. 42 ÷ 3 (= 14) or 68 ÷ 8 (= 8.5) or 42 × 3 (= 126) or (= 127.5) |  |  | M1 | for a correct first step |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | E.g. 9 × ‘14’ + 15 × ‘8.5’ oeor ‘126’ + ‘127.5’ |  |  | M1 | for a complete method |
|  |  |  | 253.5 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 2 |  |  =  = 0.5 or 50% == 0.75 or 75%  == 0.8 or 80%  =  = 0.83... or 83...% | , , ,  | 2 | B2 | can be given as fraction, decimal or percentage equivalentsB1 for 3 fractions in the correct order **or** for4 in fractions in the correct reverse order **or** for2 fractions correctly converted to decimals or percentages **or** 2 fractions written with a common denominator that is a multiple of 60 |
| --- | --- | --- | --- | --- | --- | --- |

| 3 |  | 250 ÷ (2 + 3) (= 50) |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 50 × 2 (= 100) **or** 50 × 3 (= 150) |  |  | M1 |  |
|  |  | (= 63) or 0.42 × ‘150’ oe (= 63) |  |  | M1 | (indep) for a method to find 42% of **their** amount for Haydn |
|  |  | ‘100’ – ‘63’  |  |  | M1 | (dep on M2) for finding difference between their amounts for Rose and Haydn |
|  |  |  | 37 | 5 | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| **4** | (a) |  | Pacific | 1 | B1 | Accept 1.357 × 105 |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 1.119 × 105 – 1.797 × 104 |  | 2 | M1 | Accept 111 900 – 17 970 oeor 93 930 or −93 930 |
|  |  |  | 9.393(0) × 104 | A1 | Accept (±) 9.393(0) × 104 or (±) 9.39 × 104 or (±) 9.4 × 104 |
|  |  |  |  |  |  | **Total 3 marks** |
| 5 |  | (180 – 44) ÷ 2 (= 68) |  |  | M1 | May be seen on diagram |
|  |  | 180 – ‘68’ **or** 44 + ‘68’ |  |  | M1 |  |
|  |  |  | 112 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 6 | a |  | 3 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  or 360 ÷ 60 × 12 or 360 ÷ (60 ÷ 12) oe or  |  |  | M1 | M1 Allow two stages e.g. |
|  |  |  | 72 | 2 | A1 |  |
|  | c | or 0.35 × 60 oe |  |  | M1 |  |
|  |  |  | 21 | 2 | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 7 |  | 8 + 3 × 4.50 (= 21.5) |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (30 – ‘21.5’) ÷ 1.1 (= 7.72... or 7) or8.5 ÷ 1.1 (= 7.72... or 7)  |  |  | M1 | method to find the number of packets of seeds – could be repeated addition |
|  |  | 30 – ‘21.5’ – ‘7’ × 1.1 or 8.5 – 7.7 |  |  | M1 | complete method to find the change |
|  |  |  | 0.8(0) | 4 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| **8** | (a) |  (60 ÷ 24) × 100or  |  | 2 | M1 | Complete methodaccept 4.16 × 60 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 250 | A1 | cao |
|  | (b) |  oe or 30 ÷ 24 (=1.25) or or or  |  | 2 | M1 | ft *their* 250 from (a) |
|  |  |  | 25 | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 9 |  | 3.4 or or or  or 204 oe |  | 3 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 433.5 ÷ 3.4 or 433.5 ÷or 433.5 ÷or oe |  |  | M1 | for use of speed = distance ÷ timeAllow 433.5 ÷ 3.24 (= 133.796…) for this mark only |
|  |  |  | 127.5 |  | A1 | oe allow 128 |
|  |  |  |  |  |  | **Total 3 marks** |

| 10 |  | 14 ÷ 5 × 9  |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 25.2 | 2 | A1 | oe |
|  |  |  |  |  |  | **Total 4 marks** |

| **11** | (a) |  | D | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 4 hours 52 minutes | 2 | B1 B1 |  |
|  | (c) | time = 40 + 45 (= 85 minutes oe)or 1 hr 25 min |  | 3 | M1 | accept 60 + 25May be implied by 70 ÷ 40 |
|  |  | (“85” – 15) ÷ 40 |  | M1 | dep 1st M1 |
|  |  |  | 1.75 | A1 | oe eg 1.750 or  |
|  | (d) |  | *T* = 40*k* + 15 | 2 | B2 | B1 for 40*k* +15 or *T* = 40*k* + *a* (*a* ≠ 15)Accept 40 × *k* etc |
|  |  |  |  |  | **Total 8 marks** |

| **12** |  | (Berlin) 120 ÷ 1.16 (= 103.45) |  | 4 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (Dubai) 600 × 0.24 ÷ 1.16 (= 124.14) oeor 144 ÷ 1.16 |  | M1 |  |
|  |  | “124.14” – “103.45” |  | M1 | dep on M2 Accept “103.45” – “124.14” or rounded/truncated values |
|  |  |  | 20.69 | A1 | allow 20.68 to 20.7(0) |
|  |  |  |  |  |  | **Total 4 marks** |

| 13 |  | 0.024 × 50 000 (= 1200) oe or1.024 × 50 000 (= 51 200) oe or1.0242 × 50 000 (= 52 428.8) oe or0.024 × 50 000 × 3 (= 3600) oe0.024 × 50 000 × 3 + 50 000 (= 53 600) oe |  | 3 | M1 |  | M2 for 50 000 × 1.0243  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 0.024 × (50 000 + ‘1200’) (= 1228.8) oe **and** 0.024 × (50 000 + ‘1200’ + ‘1228.8’) (= 1258.2912)**or**‘1200’ + ‘1228.8’ + ‘1258.2912’ (= 3687.(0912))**or**1.024 × ‘52 428.8’ |  |  | M1 | for completing method to find total amount in the account |
|  |  |  | 53 687 |  | A1 | accept 53 687 – 53 688 |
|  |  |  |  |  |  | accept (1 + 0.024) or  as equivalent to 1.024 throughout |
|  |  |  |  |  |  | **Total 3 marks** |

| 14 | a | (*x* =) 270 ÷ (12 × 5) (= 4.5) oe |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *π* × ‘4.5’2 × 2 × ‘4.5’ (= 182.25*π* oe) |  |  | M1 | ft dep on M1 |
|  |  |  | 573 |  | A1 | accept 572 − 573 |
|  | b |  | 1 000 000 | 1 | B1 | or (1 × ) 106 or (one or 1) million oe |
|  |  |  |  |  |  | **Total 4 marks** |

| 15 | a |  | Correct number line | 2 | B2B1 | for a fully correct number line e.g. shaded circle at −2, unshaded circle at 1 and a line drawn between them for a shaded circle at −2 **or** an unshaded circle at 1 **or** circles at −2 and 1 with line in between but shading incorrect |
| --- | --- | --- | --- | --- | --- | --- |
|  | b |  | −3, −2, −1, 0, 1, 2 | 2 | B2B1 | fully correct values with no extrasfor 5 correct values and none incorrect **or** all 6 correct values with no more than one additional incorrect value |
|  |  |  |  |  |  | **Total 4 marks** |

| 16 |  | (5 – 2) × 180 ÷ 5 (= 108) **or** 360 ÷ 5 (= 72) |  | 5 | M1 | for method to find an interior or exterior angle of a pentagon |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (6 – 2) × 180 ÷ 6 (= 120) **or** 360 ÷ 6 (= 60) |  |  | M1 | for method to find an interior or exterior angle of a hexagon |
|  |  | 360 – 108 – 120 (= 132) **or**60 + 72 (= 132) **or** (180 – ‘120’) + (180 – ‘108’) |  |  | M1 | dep on M2 for a correct method to find angle *EDI* using correct figures |
|  |  | 360 – ‘72’ – ‘60’ – ‘132’ (= 96) |  |  | M1 | for a complete method to find angle *x* |
|  |  |  | 96 |  | A1 | dep on correct working |
|  |  |  |  |  | Note: | Angles may be seen on diagram throughout |
|  |  |  |  |  |  | **Total 5 marks** |

| **17** |  |  *x* × 1.05 = 1.26 oeeg (*x* =) 1.26 ÷ 1.05 (= 1.2) | or 30 × 1.26 (= 37.80) | or 30 ÷ 1.05 (= 28.57) |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 30 ×“1.2” |  "37.80” ÷ 1.05 |  “28.57…” × 1.26 |  | M1 |  |
|  |  |  | 36 | A1 | caoIf no marks awarded, SC B1 for one operation used correctly, even with another incorrect operation. eg oeor  oeor  oe |
|  |  |  |  |  |  | **Total 3 marks** |

| **18** |  | 0.5 ×  × 62 ( = 56.54…) **or** 12 × 6 ( = 72)**or**  × 62 oe |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | “72” – “56.54…” |  | M1  | dep M1 for a complete method |
|  |  |  | 15.5 | A1 | 15.4 to 15.5 |
|  |  |  |  |  |  | **Total 3 marks** |

| **19** |  | (11 × 3) + (8 × 5) + (6 × 7) + (5 × 9) (= 160)(= 33 + 40 + 42 + 45 = 160) |  | 4 | M1 | Correct numerical products using midpoints (allowing one error) with intention to add.May be seen in table. |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | “160” + *x* = 4. 25 × (11 + 8 + 6 + 5 + *x*) oeor or “160” + *x* = 4.25 × “30” + 4.25*x* |  | M1 | dep M1 for correct equation ft *their* 160. |
|  |  | “160” – “127.5” = 4.25*x* – *x*or 32.5 = 3.25*x* |  | M1 | Isolating *x* and number terms |
|  |  |  | 10 | A1 | dep 1st M1 |
|  |  |  |  |  |  | **Total 4 marks** |

| **20** | (a) |  | 107 | 1 | B1 | Accept 105 → 109 |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 360 – 135 or 180 + 45 |  | 2 | M1 |  |
|  |  |  | 225 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 21 |  | or oe or oe or oe or oe  |  | 5 | M1 | or use of sine rule or cosine rule to find angle (*x*) of the apex or angle *y*  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  (== 4.898...) or(= 91.169…) oe or (= 91.169…) oe or(= 91.169…) oe or Allow 5 from correct working |  |  | M1 | for complete method to find height of triangle or the angle (*x*) of the apex**and**(= 4.898...) or(= 4.898...)**or****and**(= 4.898...) or(= 4.898...) |
|  |  | E.g.  (=  = 84.494...) **or**(=  = 84.494...) **or**(=  = 84.494...)  |  |  | M1 | for method to find the total area of the pentagon allow answers in the range 84.49 – 85  |
|  |  | E.g. ‘84.494’ ÷ 16 (= 5.28...) or (= 5.28...)  |  |  | M1 | for method to find the number of tins required using their area |
|  |  |  | 6 |  | A1 | dep on at least M2 |
|  |  |  |  |  |  | **Total 5 marks** |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | **Edexcel averages: scores of candidates who achieved grade:** |
| **Qn** | **Max score** | **Mean %** | **ALL** | **5** | **4** | **3** | **2** | **1** | **U** |
| **1** | 3 | 85 | 2.56 | 2.79 | 2.74 | 2.41 | 1.91 | 1.25 | 0.50 |
| **2** | 2 | 88 | 1.75 | 1.89 | 1.79 | 1.66 | 1.32 | 1.33 | 0.50 |
| **3** | 5 | 69 | 3.47 | 4.71 | 3.69 | 1.72 | 0.14 | 0.08 | 0.00 |
| **4** | 3 | 73 | 2.19 | 2.50 | 2.19 | 1.87 | 1.31 | 1.42 | 0.00 |
| **5** | 3 | 73 | 2.19 | 2.82 | 2.13 | 1.69 | 0.41 | 0.17 | 0.00 |
| **6** | 5 | 67 | 3.35 | 4.04 | 3.41 | 2.46 | 2.04 | 0.67 | 0.00 |
| **7** | 4 | 72 | 2.86 | 3.51 | 2.67 | 1.94 | 1.68 | 1.08 | 0.50 |
| **8** | 4 | 65 | 2.59 | 3.26 | 2.47 | 1.97 | 0.91 | 0.33 | 0.00 |
| **9** | 3 | 64 | 1.93 | 2.52 | 1.82 | 1.16 | 0.59 | 0.33 | 0.50 |
| **10** | 2 | 58 | 1.16 | 1.56 | 1.21 | 0.69 | 0.09 | 0.00 | 0.00 |
| **11** | 8 | 60 | 4.77 | 6.26 | 4.26 | 3.14 | 1.43 | 0.83 | 0.00 |
| **12** | 4 | 56 | 2.24 | 2.97 | 1.97 | 1.35 | 0.78 | 0.17 | 0.00 |
| **13** | 3 | 51 | 1.52 | 2.09 | 1.31 | 0.91 | 0.23 | 0.08 | 0.00 |
| **14** | 4 | 47 | 1.89 | 2.77 | 1.52 | 0.56 | 0.18 | 0.08 | 0.00 |
| **15** | 4 | 42 | 1.69 | 2.37 | 1.15 | 0.82 | 0.78 | 0.00 | 0.00 |
| **16** | 5 | 48 | 2.40 | 3.61 | 1.41 | 1.12 | 0.05 | 0.00 | 0.00 |
| **17** | 3 | 40 | 1.20 | 1.59 | 0.84 | 0.71 | 0.48 | 0.67 | 0.00 |
| **18** | 3 | 47 | 1.42 | 2.24 | 0.63 | 0.42 | 0.09 | 0.00 | 0.00 |
| **19** | 4 | 35 | 1.39 | 2.17 | 0.79 | 0.10 | 0.26 | 0.08 | 0.00 |
| **20** | 3 | 22 | 0.67 | 1.00 | 0.37 | 0.23 | 0.17 | 0.17 | 0.00 |
| **21** | 5 | 23 | 1.14 | 1.92 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | **80** | **55** | **44.38** | **58.59** | **38.75** | **26.93** | **14.85** | **8.74** | **2.00** |

**Suggested grade boundaries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grade** | **5** | **4** | **3** | **2** | **1** |
| Mark | 48 | 33 | 21 | 12 | 6 |