| Qn |  | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- | --- |
| 1 |  | 8.5² + 5.6² (= 103.61) |  | 3 | M1 |  |
|  |  |    |  |  | M1 |  |
|  |  |  | 10.2 |  | A1 | Accept 10.1 to 10.2 or better |
|  |  |  |  |  |  | **Total 3 marks** |

| 2 |  | 3 hours 36 mins = 216 (mins) or 3.6 (hours)or 3 oe (hours) |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 2470 ÷ 3.6 or 2470 ÷ 3 or 2470 ÷ 216 × 60 |  |  | M1 | Allow 2470 ÷ 3.36 (=735 or better) |
|  |  |  | 686 |  | A1 | Accept 686.1 or better |
|  |  |  |  |  |  | **Total 3 marks** |

| 3 |  | 30 =  |  | 3 | M1 | Or for (= 0.9)  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 1.2*x* = or 36*x* = 27 or 22.5 ÷ 30 |  |  | M1 |   |
|  |  |  | 0.75 oe |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 4 |  | 0.4 × 75(= 30) oe |  | 4 | M1 | M2 for 0.6 × 75(= 45) oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 75 – 30 (= 45) |  |  | M1 |  |
|  |  |  (T-Shirt =) or (Bag =) oe or t + (t + 12) = 45 oe |  |  | M1 | (T-shirt = £16.50) |
|  |  |  | 28.5(0) |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 5 |  | e.g. (*EF* =) 12cos40 (= 9.19...) **or** (*FD* =) 12sin40 (= 7.71...) **and** (*EF* =)  (= 9.19...) |  |  | M2 | complete method to find *EF*(if not M2 then M1 for a correct statement involving *EF* e.g.) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g.  or  **or**  **and**  |  |  | M1 | (dep on M2) for a correct trig statement involving *EG* **or** complete method to find *FG* **and** a correct start to Pythagoras process |
|  |  |  | 17.3 | 4 | A1 | accept 17.2 – 17.3 |
|  |  |  |  |  |  | **Total 4 marks** |

| 6 |  | 20 000 × 0.813 oe |  |  | M2 | M1 for 20 000 × 0.81 oe (= 16 200 )or 20 000 × 1.19 oe (= 23 800)or 20 000 × 1.193 oe (= 33 703.18 ) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 10 629 |  | A1 | Accept 10 628 → 10 629 |
|  |  |  |  |  |  | **Total 3 marks** |

| 7 |  |  (= 81.4....) |  |  | M1 | allow 81.3 – 81.5 for area of semi circle |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | “81.4” ÷ 6 (= 13.5...) **or** 12 × 6 (= 72) **or** “81.4” ÷ 12 (= 6.7...) |  |  | M1 | (dep) allow 13.5 – 13.6 for the number of boxes needed (NB: 12 × 6 = 72 alone is 0 marks) |
|  |  |  | No with correct figures | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 8 | (a) |  | 3.74 × 107 | 2 | B2 | B1 for 37 400 000 (oe but not in standard form) or 3.74 x 10*n* (*n* ≠ 7)or 3.7 x 107 or 3.8 x 107 |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  | 11 | 1 | B1 | Allow 11 →11.1 |
|  |  |  |  |  |  | **Total 3 marks** |

| 9 |  | 28 × 5 (= 140) **OR** 26.5 × 2 (= 53) |  |  | M1 | or 87 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (28 × 5 − 26.5 × 2) ÷ (5 – 2) |  |  | M1 | for a complete method |
|  |  |  | 29 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 10 |  | 10 × 5 + 30 × 11 + 50 × 8 + 70 × 19 + 90 × 9(50 + 330 + 400 + 1330 + 810) |  | 3 | M2 | Correct products using midpoints (allowing one error) with intention to add.M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add.or correct products using midpoints without addition (allow 1 error) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 2920 |  | A1 | N.B. 2920 ÷ 52 (=56.2..) scores M2A0 |
|  |  |  |  |  |  | **Total 3 marks** |

| 11 |  | 20.40 ÷ (1 – 0.15) |  |  | M2(M1) | for a complete method eg 20.40 ÷ (1 – 0.15)for 20.40 ÷ (100 – 15) (= 0.24) **or** e.g. 0.85*x* = 20.40 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 24 | 3 | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 12 |  |  × (7+12) × 10 = 608 oe |  | 3 | M2 | M1 for × (7 + 12) × 10 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 6.4 |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 13 | (a)  | eg  oeor 2(4 – 3x) – 5(3x – 5) = – 3 x 2 x 5  |  | 3 | M1 | Correct fractions over common denominator as an equation orMultiplying both sides by 10 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 8 – 6x – 15x + 25 = −30 oe |  |  | M1 | A correct equation with no denominators or brackets |
|  |  |  | 3 |  | A1 | dep on M1 |
|  | (b) | (5y + 8)(y – 5) (≤0)or (y =)  |  | 3 | M1 | Correct method to solve 3 term quadratic – factorising or correct use of formula |
|  |  | −1.6, 5 oe |  |  | A1 | Correct critical values |
|  |  |  | −1.6 ≤ y ≤ 5 oe |  | A1 | Condone change of variable in place of y throughout this question. |
|  |  |  |  |  |  | **Total 6 marks** |

| 14 |  | 1.5 × 2 × 8 (= 24 (cm3)) |  |  | M1 | for finding the volume of the cuboid |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. (*V* = )  (= 296.58...) **or**(*M* = ) 19.32 × “24” (= 463.68) |  |  | M2 | complete method to find the volume of statue **or** the mass of one block, could work in g or kg(if not M2 then award M1 for correct use of density formula e.g.  **or** ) |
|  |  | e.g. “296.58” ÷ “24” (= 12.3576...) **or** “5730” ÷ “463.68” (= 12.3576...) |  |  | M1 | could work in g or kg |
|  |  |  | 13 | 5 | A1 | cao |
|  |  |  |  |  |  | **Total 5 marks** |

| 15 |  | 0.42 ÷ 0.6 (= 0.7) oe |  |  | M1 | (indep) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 1 – “0.7” (= 0.3) oe **OR** 1 – 0.6 (= 0.4) oe |  |  | M1 | (indep) |
|  |  | “0.3” × “0.4” oe **OR** 1 – (0.42 + 0.6 × “0.3” + “0.4” × “0.7”) oe |  |  | M1 | for a complete method |
|  |  |  | 0.12 | 4 | A1 | oe |
|  |  |  |  |  |  | **Total 4 marks** |

| 16 |  |  180 – 2 × 66 (= 48)(360 – “48”) ÷ 2 (= 156)180 – “156” (= 24) 360 ÷ “24” |  | 3 | M1M1ft | Could be marked on diagramFinal stage of calculation |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Alt : 180 – 2 × 66 (= 48)360 ÷ (0.5 × “48”) |  |  | M1M1ft | Could be marked on diagramFinal stage of calculation |
|  |  | Alt:180 – 2 × 66 (= 48)(360 – “48”) ÷ 2 (= 156) = “156”“24”n = 360 or (= 156) |  |  | M1M1ft | Could be marked on diagramFinal stage of calculation or embedded correct answer. |
|  |  |  | 15 |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 17 |  | e.g. *x* = 0.57272.... **and** 100*x* = 57.272....**OR** e.g. 10*x* = 5.7272.... **and** 1000*x* = 572.72.... |  |  | M1 | For 2 recurring decimals with correct algebraic labels that when subtracted give a whole number or terminating decimal eg 56.7 or 567 etc e.g. 100*x* = 57.272.... **and** *x* = 0.57272.... **OR** 1000*x* = 572.72....**and** 10*x* = 5.7272.... **with intention to subtract.** (If recurring dots not shown then showing at least the digits 57272, ie 5sf)  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. 100*x* – *x* = 57.272.... – 0.57272.... = 56.7 **and** **or** 1000*x* – 10*x* = 572.72.... – 5.7272.... = 567 **and**  | Shown | 2 | A1 | for completion to  |
|  |  |  |  |  |  | **Total 2 marks** |

| 18 | (a) |  |  | 2 | B2  | B1 for oeB1 for all other correct probabilities 2d.p truncated or rounded (e.g 0.58 or 0.41 or 0.42) |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) |  x or x oe |  | 3 | M1ft |  |
|  |  |  x + x oe |  |  | M1ft |  |
|  |  |  | oe |  | A1 | eg or 0.46....(2 dp truncated or rounded) |
|  | (c) |  x x x = oe  |  | 3 | M1ft | A correct equation involving the unknown probability |
|  |  |  x = ÷ (= ) oe |  |  | M1ft | Isolating or calculating the value of x |
|  |  |   | 25 |  | A1 | Dep on M1 |
|  |  |  |  |  |  | **Total 8 marks** |

| 19 |  | eg 5 × 2*x* + 10 × *x* = 160 **OR** 160 ÷ 2 (= 80) [freq of one bar]**OR** 40 × 5 + 20 × 10 (= 400) [total no. of sml squares]**OR** 160 ÷ 16 (= 10) [students per 1cm2]**OR**1cm2 = 10 students **OR****e.g.** 5 small squares = 2 students oe |  |  | M1 | for setting up an appropriate equation **OR** finding the area of the 2nd or 3rd bar **OR** finding the total number of small squares **OR** for finding the number of students per 1cm2 **or** 1cm2 = 10 students **OR** other appropriate scale e.g. 5 small squares = 2 students |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | ‘*x*’ = 8 **OR** 8 or 16 seen in the correct position on the vertical scale **OR** 160 ÷ “400” (= 0.4 oe) |  |  | M1 | for finding frequency density **OR** method to find the frequency of the 1st, 4th or 5th bar (1st is 108, 4th is 90, 5th is 12) |
|  |  | “7.2” × 15 + 160 + “6” × 15 + “2.4” × 5 **OR** 160 + “0.4” × (18 × 15 + 15 × 15 + 5 × 6)  |  |  | M1 | (dep on at least M1) for a complete method to find the total frequency(allow one error or one repeat but no omission) |
|  |  |  | 370 | 4 | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 20 |  | (ASF =) or  |  | 4 | M1 | Correct SF for area. Accept 1.442 (= 2.07 or 2.09) or better for ASFor 0.692 (= 0.47 or 0.48) or better for ASF |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  eg A + “( ” A = 1800 |  |  | M1ft | Dep on previous M1 |
|  |  | eg “” A = 1800  |  |  | M1ft |  |
|  |  |  | 583.2 |  | A1 | Awrt 583 |
|  |  |  |  |  |  | **Total 4 marks** |

| 21 |  |  (= 8.3562...) |  |  | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |   |  |  | M1 |  |
|  |  | Acute version of(= 61.35…) |  |  | M1 |  |
|  |  | ACB = 180 – “61.353…” (= 118.647...) |  |  | M1 |  |
|  |  |  (= 153.98...) |  |  | M1 |  |
|  |  |  | 12.4 | 6 | A1 | accept 12.3 – 12.5 |
|  |  |  |  |  |  | **Total 6 marks** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | **Edexcel averages: scores of candidates who achieved grade:** |
| **Qn** | **Paper** | **Question** | **Skill tested** | **Max score** | **Mean %** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| **1** | **2HR** | Q04 | Trigonometry and Pythagoras' Theorem | 3 | 92 | 2.76 | 2.99 | 2.98 | 2.92 | 2.90 | 2.60 | 2.29 | 2.03 |
| **2** | **2HR** | Q05 | Measures | 3 | 88 | 2.65 | 2.99 | 2.91 | 2.90 | 2.67 | 2.42 | 1.92 | 1.28 |
| **3** | **2HR** | Q09 | Measures | 3 | 83 | 2.48 | 2.97 | 2.86 | 2.78 | 2.39 | 1.76 | 1.12 | 0.94 |
| **4** | **2FR** | Q13 | Applying Number | 4 | 88 | 3.50 | 4.00 | 3.80 | 3.65 | 3.50 | 3.39 | 2.32 | 2.19 |
| **5** | **1HR** | Q15 | Trigonometry and Pythagoras' Theorem | 4 | 79 | 3.15 | 3.89 | 3.70 | 3.60 | 2.89 | 2.06 | 1.14 | 0.53 |
| **6** | **2HR** | Q08 | Percentages | 3 | 87 | 2.62 | 2.97 | 2.90 | 2.69 | 2.55 | 2.34 | 2.01 | 1.42 |
| **7** | **1HR** | Q05 | Mensuration of 2D shapes | 3 | 80 | 2.39 | 2.90 | 2.75 | 2.65 | 2.23 | 2.00 | 1.01 | 0.69 |
| **8** | **2HR** | Q10 | Standard form | 3 | 84 | 2.52 | 2.93 | 2.78 | 2.62 | 2.47 | 2.03 | 1.64 | 1.59 |
| **9** | **1HR** | Q08 | Statistical measures | 3 | 78 | 2.35 | 2.95 | 2.83 | 2.42 | 2.21 | 1.50 | 0.65 | 0.58 |
| **10** | **2HR** | Q02 | Statistical measures | 3 | 78 | 2.34 | 2.85 | 2.71 | 2.38 | 2.09 | 1.52 | 1.40 | 1.11 |
| **11** | **1HR** | Q07 | Percentages | 3 | 75 | 2.26 | 2.96 | 2.78 | 2.28 | 1.81 | 1.19 | 0.72 | 0.42 |
| **12** | **2HR** | Q13 | 3D shapes and volume | 3 | 72 | 2.16 | 2.90 | 2.73 | 2.22 | 1.94 | 0.96 | 0.15 | 0.08 |
| **13** | **2HR** | Q19 | Inequalities | 6 | 63 | 3.80 | 5.56 | 4.65 | 3.80 | 2.64 | 1.82 | 1.06 | 0.39 |
| **14** | **1HR** | Q09 | Measures | 5 | 66 | 3.29 | 4.66 | 4.07 | 3.10 | 2.29 | 1.61 | 0.83 | 0.50 |
| **15** | **1HR** | Q16 | Probability | 4 | 67 | 2.66 | 3.77 | 3.44 | 2.46 | 1.78 | 1.02 | 0.63 | 0.53 |
| **16** | **2HR** | Q12 | Polygons | 3 | 66 | 1.98 | 2.91 | 2.48 | 1.70 | 1.15 | 0.84 | 0.36 | 0.39 |
| **17** | **1HR** | Q13a | Decimals | 2 | 57 | 1.15 | 1.76 | 1.43 | 1.08 | 0.47 | 0.44 | 0.26 | 0.08 |
| **18** | **2HR** | Q16 | Probability | 8 | 57 | 4.53 | 7.11 | 5.33 | 3.75 | 2.67 | 1.88 | 1.54 | 1.22 |
| **19** | **1HR** | Q19 | Graphical representation of data | 4 | 54 | 2.15 | 3.44 | 2.72 | 1.52 | 1.11 | 0.53 | 0.18 | 0.14 |
| **20** | **2HR** | Q20 | Similarity | 4 | 45 | 1.81 | 3.52 | 2.10 | 0.82 | 0.50 | 0.12 | 0.10 | 0.03 |
| **21** | **1HR** | Q21 | Trigonometry and Pythagoras' Theorem | 6 | 25 | 1.48 | 3.13 | 1.60 | 0.72 | 0.41 | 0.28 | 0.05 | 0.03 |
|  |  |  |  | **80** | **68** | **54.03** | **73.16** | **63.55** | **52.06** | **42.67** | **32.31** | **21.38** | **16.17** |

**Suggested grade boundaries**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Grade** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| Mark | 68 | 58 | 47 | 37 | 26 | 19 | 15 |