| 1 |  | for 0.08 × 1200 oe (= 96) **or** 1.08 × 1200 oe (= 1296) | **OR** 1200 × 1.083 |  | 3 | M1 | for 0.08 × 1200 oe (= 96) **or** 1.08 × 1200 oe (= 1296) | **OR** M2 for 1200 × 1.083 **or** 1200 × 1.084 (= 1632.59)(M1 for 1200 × 1.082 (= 1399.68)) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 1.08 × “1296” (= 1399.68) oe1.08 × “1399.68” (= 1511.6544) oe |  |  | M1 | for completing method to find total amount in the account |
|  |  |  | 1512 |  | A1 | accept 1511 – 1512 |
|  |  |  |  |  |  | **SC:** if no other marks gained award M1 for 0.24 × 1200 oe **or** 288 **or** 1488accept (1 + 0.08) as equivalent to 1.08 throughout |
|  |  |  |  |  |  | **Total 3 marks** |

| 2 |  | Use of 2 hrs 42 mins = 2.7 hrs **or** 162 mins |  | 4 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. 90 × 2.7 (= 243) **or** e.g.  **or** e.g.  |  |  | M1 | for use of *D* = *S* × *T* (accept use of their time e.g. 90 × 2.42) **or** for setting up an equation using proportion |
|  |  | e.g. “243” ÷ 3 **or**  |  |  | M1 | (dep on M1) for their *D* ÷ 3 **or** for solving their equation |
|  |  |  | 81 |  | A1 |  |
|  |  |  |  |  |  | **Total 4 marks** |

| 3 |  | e.g.  **or**  **or**  |  | 5 | M2(M1 | for a complete method to find the number of chocolate cakes **or** lemon cakes **or** fruit cakes“10” comes from 3 + 2 + 5for correct use of the ratio e.g. 80 ÷ “10” (= 8)) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. “16” × × 1.7(0) (= 20.4(0)) **or** “40” × × 2.4(0) (= 84)   |  |  | M1 | for a method to find the profit for lemon cakes **or** fruit cakes |
|  |  | e.g. “24” × 2 (= 48) **and** “16” × × 1.7(0) (= 20.4(0)) **and** “40” × × 2.4(0) (= 84)  |  |  | M1 | for a method to find the profit for all 3 cakes |
|  |  |  | 152.4(0) |  | A1 |  |
|  |  |  |  |  |  | **Total 5 marks** |

| 4 |  | 8265 – 7500 (= 765) **or**  |  | 3 | M1 | 8265 – 7500 could be embedded in another calculation. |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  oe **or** “1.102” × 100 – 100 oe |  |  | M1 |  |
|  |  |  | 10.2 |  | A1 | oe |

| 5 |  |  ( = 93.75π = 294.5243...) |  | 5 | M1 | for using the formula for volume of cylinder |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 | for using with *their* intended volume *v* |
|  |  | (*m* =) 21.5 × ‘294.5243...’ ( = 6332.272692) |  |  | M1 | for rearranging for *m* = *d* × *v*  |
|  |  | ‘6332.27269’ ÷ 1000 × 5 (=31.661…) or ‘6332.27269’ ÷ 6 ÷ 1000 (= 1.055…) or‘6332.27269’× 5 **and** 30 × 1000 (=30 000) or30 ÷ (‘6332.27269’ ÷ 1000) (= 4.7376…) |  |  | M1 | for a correct calculation that would enable a conclusion to be made based on mass |
|  |  |  | No and correct comparable figure(s) |  | A1 | for No oe and (31.6 to 31.7 **or** 1.05 to 1.06 **or** 4.70 to 4.74) seen |
|  |  |  |  |  |  | **Total 5 marks** |

| 6 |  | 15 × 24 (= 360) **or** 25 × 18 (= 450) |  | 3 | M1 | may be implied by 810 seen |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  (=) |  |  | M1 | dep on M1  |
|  |  |  | 20.25 oe |  | A1  | for 20.25 accept 20.3 (allow 20 from correct working) |
|  |  |  |  |  |  | **Total 3 marks** |

| 7 |  | or or  **and**  or  **and**  |  | 5 | M1  | oe eg *x* for *AB* |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  (=18.3…) **or**  (=18.3…)**or** **or**  |  |  | M1  |  |
|  |  | ‘18.3’ × 4 (= 73.2) |  |  | M1 | dep 1st M1 |
|  |  | 80 − ‘18.3’ × 4 or 80 – ‘73.2’ |  |  | M1 | dep 1st M1 |
|  |  |  | 6.75 |  | A1 | accept 6.75 – 6.8  |
|  |  |  |  |  |  | **Total 5 marks** |

| 8 | (a) |  | 30 < *t* ≤ 40 | 1 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | e.g. 5 × 4 + 15 × 10 + 25 × 15 + 35 × 25 + 45 × 6 (= 1690)**or** 20 + 150 + 375 + 875 + 270 (= 1690) |  | 4 | M2 | For correct products using midpoints (allowing one error) with intention to add.  If not M2 then award M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add or correct products using midpoint without addition. |
|  |  | “1690” ÷ 60 |  |  | M1 | dep on M1 |
|  |  |  | 28.2 |  | A1 | accept 28.1 – 28.2 |
|  |  |  |  |  |  | **Total 5 marks** |

| 9 |  | or or  or  oe  |  | 2 | M1 | for making *y* or 2*y* the subject Allow oe |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | −2.5 |  | A1 | for −or −2.5 |
|  |  |  |  |  |  | **Total 3 marks** |

| 10 |  |  or   |  | 4 | M1 | for squaring and adding |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  or  or 7.71(038…) or 7.7 |  |  | M1 | dep 1st M1 for square rooting |
|  |  | e.g (‘7.71’ + 4.3 + 6.4) × 22 or ’18.4’ × 22 (=404.8) or(‘8’ + 4.3 + 6.4) × 22 or ’18.7’ × 22 or ‘19’ × 22 or‘20’ × 22 |  |  | M1 | dep M2 for a non-rounded perimeter × 22or 19 × 22accept 20 × 22 oe |
|  |  |  | $418 |  | A1 | cao |
|  |  |  |  |  |  | **Total 4 marks** |

| 11 |  | e.g. 1.5 × 1.5 (= 2.25 oe) |  | 3 | M1 | for calculating the area of the square, may be seen embedded within a calculation |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. 34.8 × “2.25” |  |  | M1 | for a complete method to find the force |
|  |  |  | 78.3 |  | A1 | oe |
|  |  |  |  |  |  | **Total 3 marks** |

| 12 |  |  |  | 3 | M1 | for one of - 5 numbers with a median of 8- 5 numbers with a mode of 5- 5 numbers with a range of 10- 5 numbers with a sum of 45 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 | for two of - 5 numbers with a median of 8- 5 numbers with a mode of 5- 5 numbers with a range of 10- 5 numbers with a sum of 45 |
|  |  |  | 5, 5, 8, 12, 15 |  | A1 | Note: The numbers can be in any orderSC If no marks awarded, give B1 for 8 in the middle cell, not contradicted. |
|  |  |  |  |  |  | **Total 3 marks** |

| 13 |  | e.g. 31.5(0) ÷ (1 – 0.3) |  | 3 | M2(M1) | for a complete method e.g. 31.5(0) ÷ (1 – 0.3)for 31.5(0) ÷ (100 – 30) (= 0.45) **or** e.g. (1 – 0.3)*x* = 31.5(0) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 45 |  | A1 |  |
|  |  |  |  |  |  | **Total 3 marks** |

| 14 | (a) | 35 37 38 39 41 42 43 44 45 47 47 |  | 3 | M1 | Ordering values (allow 1 error)error may include missing a valueMay be implied by correct values for LQ **and** UQ. |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 | LQ = 38 **and** UQ = 45 identified  |
|  |  |  | 7 |  | A1 |  |
|  | (b) |  | January and reason using IQR | 1 | B1 | ft from part (a) January as the IQR is lower oeignore irrelevant statements about the median if given in addition to correct statements about IQR. |
|  |  |  |  |  |  | **Total 4 marks** |

| 15 |  |  |  | 4 | M1 | oe for setting up a correct expression for the area of the sector (or equation) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |    |  |  | M1 | for correctly rearranging for *AOC* |
|  |  | (Angle *ABC* =) “79.57747” ÷ 2 (= 39.7887… or ) |  |  | M1 | ft dep 1st M1 **and** ‘*x*’ less than 360for dividing their ‘*AOC*’ by 2  |
|  |  |  | 39.8 |  | A1 | for awrt 39.8accept  |
|  |  |  |  |  |  | **Total 4 marks** |

| 16 |  | e.g. *a* = (−3 + 47) ÷ 2 (= 22) **or**  (*b* = −38 −11 = −49) **or** method to add 25 to −3**or** method to subtract 25 from 47**or** method to subtract 30 from −19 **or** method to subtract 60 from 11  |  | 2 | M1 | for a correct method to find either coordinate or one coordinate correct. Look for correct method on their diagram, if used.  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |   | *a* = 22, *b* = −49 |  | A1 | both correct |
|  |  |  |  |  |  | **Total 2 marks** |

| 17 |  | 14 ÷ 10 (= 1.4) **or**at least two of (3.2 × 15 (=48) or 3.6 × 5 (=18) or 0.6 × 10 (=6) or 0.2 × 20 (=4) **or**at least two of (140, 480, 180, 60, 40) **or**  |  | 3 | M1 | for any one correct frequency density or 1cm2 = 2.5 or association of area with frequencyeg one small square = 0.1 (on vertical axis) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 14 + 3.2 × 15 + 3.6 × 5 + 0.6 × 10 + 0.2 × 20 **or**14 + 48 + 18 + 6 + 4 **or** (140 + 480 + 180 + 60 + 40) × **or**900 ×  |  |  | M1 | for any correct methodAllow one error in their total (error may include missing a total for a bar) |
|  |  |  | 90 |  | A1 | answer from correct working |
|  |  |  |  |  |  | **Total 3 marks** |

| 18 |  | Ext angle of octagon = 360 ÷ 8 (= 45) **or** Int angle of octagon (8 – 2) × 180 ÷ 8 oe (= 135) |  | 6 | M1 | for method to find the size of one exterior **or** one interior angle of a regular octagon |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | e.g. 10 + 2 × 10 × sin45 (= or 24.1...)**or** e.g.  (= 24.1…) |  |  | M1 | method to find *HE* **or** *AD*22.5 comes from (180 – “135”) ÷ 2112.5 comes from “135” – “22.5”  |
|  |  | e.g. 10 × (“”) (= 100 + or 241.4...) **or** 10 × “24.1…” (= 241.4…) |  |  | M1 | area *ADEH* |
|  |  | e.g. 10 × sin45° (=5or 7.07...)**or** e.g.  (= 18.4…) **or**  (= 18.4…) |  |  | M1 | finds perpendicular height of triangle *ACD* (may be found before, but must realise this is also height of triangle) **or** finds the length of *AC*22.5 comes from (180 – “135”) ÷ 2 |
|  |  | e.g. 0.5 × “24.1...” × “7.07…” (= 85.3...) **or** (= 85.3…) |  |  | M1 | finds the area of triangle *ACD*112.5 comes from “135” – “22.5”  |
|  |  |  | 327 |  | A1 | accept 326 – 327 |
|  |  | **Alternative (splitting octagon into triangles and subtracting trapezium and triangle)** |  |  |  |  |
|  |  | Ext angle of octagon = 360 ÷ 8 (= 45) **or** Int angle of octagon (8 – 2) × 180 ÷ 8 oe (= 135)**or** one of 8 angles at centre = 360 ÷ 8 (= 45) |  | 6 | M1 | for method to find the size of one exterior **or** one interior angle of a regular octagon **or** method to find one angle at centre of octagon when split into 8 equal triangles |
|  |  | e.g. 0.5 × 10 × 5 × tan67.5 (= 60.35...) **or** **or** Octagon = 8 × “60.35” (= 482.8...) |  |  | M1 | Area of one triangle (one-eighth of octagon) **or** octagon |
|  |  | e.g. 10 + 2 × 10×sin45°(= =24.14..)  |  |  | M1 | Method to find *HE* |
|  |  | 0.5 × (10 + )×(=120.71...)  |  |  | M1 | Method to find area of trapezium *HEGF* |
|  |  | 0.5 × 10 × 10 × sin135°(= 35.35...) |  |  | M1 | Method to find area of triangle *ABC* |

| 19 |  | 8.35 **or** 7.25 **or** 6.15 **or** 5.25 |  | 3 | B1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (8.35×7.25) – (6.15×5.25) |  |  | M1 | Allow UB*AD*×UB*DC*– LB*EH*×LB*HG*where8.3< UB*AD* ≤8.35, 7.2< UB*DC* ≤7.256.15 ≤ LB*EH*< 6.2, 5.25 ≤ LB*HG*< 5.3 |
|  |  |  | 28.25 |  | A1 | oe, dep on M1 |
|  |  |  |  |  |  | **Total 3 marks** |

| 20 |  | or or (2, 1) |  | 6 | M1 | for finding midpoint |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | or or or  |  |  | M1 | indep for finding the gradient of *PQ* |
|  |  |  or  or  or  or 0.6 |  |  | M1 | for finding the perpendicular gradient to *PQ*(ft their stated gradient) |
|   |  | or *c* = or *c* = or *c* = −0.2 |  |  | M1 | dep on 1st and 3rd M1 for substituting ‘(2, 1)’ into  or find the value of *c* oe eg   |
|  |  |  or  or  |  |  | A1 | for a correct equation in any form |
|  |  |  |  |  | A1 | for  or or oeaccept in the form  eg or oe |
|  |  |  |  |  |  | **Total 6 marks** |

| 21 |  | e.g. (=  ) **or**e.g.  oe |  | 4 | M2(M1 | for all correct products and intention to addfor one correct product) |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 5*x*² − 47*x* + 18 = 0 oe(*x* = 9)**or** 5*N*² − 117*N* + 592 = 0 |  |  | M1 | Correct quadratic equation |
|  |  |  | 16 |  | A1 | dep on M3 |
|  |  |  |  |  |  | **Total 4 marks** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Qn** | **Skill tested** | **Mean score** | **Max score** | **Mean %** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| **1** | Percentages  | 2.59 | 3 | 86 | 2.59 | 2.92 | 2.83 | 2.75 | 2.53 | 1.96 | 1.86 | 0.33 |
| **2** | Measures  | 3.29 | 4 | 82 | 3.29 | 3.90 | 3.87 | 3.61 | 3.17 | 1.83 | 1.29 | 0.56 |
| **3** | Ratio and proportion  | 4.00 | 5 | 80 | 4.00 | 4.85 | 4.77 | 4.20 | 3.23 | 2.96 | 1.18 | 0.22 |
| **4** | Percentages  | 2.35 | 3 | 78 | 2.35 | 2.77 | 2.71 | 2.46 | 2.00 | 1.63 | 1.36 | 0.44 |
| **5** | Measures  | 3.59 | 5 | 72 | 3.59 | 4.84 | 4.42 | 3.98 | 2.70 | 1.06 | 0.64 | 0.11 |
| **6** | Statistical measures  | 2.17 | 3 | 72 | 2.17 | 2.88 | 2.61 | 2.38 | 1.47 | 1.12 | 0.25 | 0.00 |
| **7** | Trigonometry  | 3.58 | 5 | 72 | 3.58 | 4.85 | 4.46 | 3.92 | 2.43 | 1.39 | 0.25 | 0.00 |
| **8** | Statistical measures  | 3.82 | 5 | 76 | 3.82 | 4.90 | 4.55 | 3.63 | 3.59 | 2.41 | 0.65 | 0.00 |
| **9** | Algebraic manipulation  | 1.36 | 2 | 68 | 1.36 | 1.97 | 1.77 | 1.45 | 0.66 | 0.37 | 0.04 | 0.00 |
| **10** | Trigonometry  | 2.66 | 4 | 67 | 2.66 | 3.37 | 2.85 | 2.84 | 2.57 | 1.73 | 0.46 | 0.56 |
| **11** | Measures  | 2.03 | 3 | 68 | 2.03 | 2.74 | 2.56 | 2.08 | 1.55 | 0.87 | 0.25 | 0.00 |
| **12** | Probability  | 2.04 | 3 | 68 | 2.04 | 2.82 | 2.40 | 2.04 | 1.28 | 1.04 | 0.54 | 0.22 |
| **13** | Percentages  | 2.04 | 3 | 68 | 2.04 | 2.86 | 2.54 | 1.90 | 1.40 | 0.87 | 0.43 | 0.00 |
| **14** | Statistical measures  | 2.28 | 4 | 57 | 2.28 | 3.47 | 2.72 | 1.99 | 1.13 | 0.90 | 0.39 | 0.33 |
| **15** | Mensuration of 2D shapes  | 2.24 | 4 | 56 | 2.24 | 3.84 | 2.98 | 1.80 | 0.49 | 0.20 | 0.00 | 0.00 |
| **16** | Graphs  | 1.14 | 2 | 57 | 1.14 | 1.82 | 1.52 | 0.88 | 0.57 | 0.23 | 0.07 | 0.00 |
| **17** | Graphical representation of data  | 1.58 | 3 | 53 | 1.58 | 2.59 | 2.01 | 1.30 | 0.64 | 0.25 | 0.04 | 0.00 |
| **18** | Polygons  | 2.78 | 6 | 46 | 2.78 | 5.21 | 3.23 | 1.96 | 0.53 | 0.15 | 0.04 | 0.00 |
| **19** | Degree of accuracy  | 1.49 | 3 | 50 | 1.49 | 2.75 | 1.82 | 0.95 | 0.30 | 0.17 | 0.04 | 0.00 |
| **20** | Linear equations  | 2.13 | 6 | 36 | 2.13 | 4.38 | 2.05 | 0.99 | 0.51 | 0.24 | 0.07 | 0.11 |
| **21** | Probability  | 1.37 | 4 | 34 | 1.37 | 3.13 | 1.25 | 0.35 | 0.11 | 0.00 | 0.00 | 0.00 |
|  |  | **50.53** | **80** | **63** | **50.53** | **72.86** | **59.92** | **47.46** | **32.86** | **21.38** | **9.85** | **2.88** |

**Suggested grade boundaries**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Grade** | **9** | **8** | **7** | **6** | **5** | **4** | **3** |
| Mark | 66 | 54 | 40 | 27 | 16 | 8 | 2 |