| Paper 1MA1: 2H | | | |
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| **Question** | **Working** | **Answer** | **Notes** |
| 1 | | $t = \frac{w - 11}{3}$ | M1 For isolating term in $t$, eg. $3t = w - 11$ or dividing all terms by 3, eg. $\frac{w}{3} = \frac{3t}{3} + \frac{11}{3}$<br>A1 for $t = \frac{w-11}{3}$ oe |
| 2 | | Jardins of Paris | P1 correct process to convert one price to another currecncy, eg 1980 ÷ 1.34<br>P1 for a complete process leading to 3 prices in the same currency<br>C1 for 3 correct and consistent results and a correct comparison made. |
| 3 | | Mean of 96 or net deviation of 0<br>so target met | M1 for correct interpretation of the graph, with at least one correct reading or a line drawn through 96 with at least one correct deviation<br>M1 complete method to find mean of six months sales, eg. (110+84+78+94+90+120)÷6 (= 96) or the mean of six deviations,<br>C1 eg. (14–12–16–2–6+24)÷6 (= 0)<br>for a correct answer of 96 or 0 with correct conclusion |

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| 4 a | | $160 < h \leq 170$ | B1 for identifying the correct class interval |
| b | | 1. Points should be plotted at mid-interval values<br>2. The polygon should not be closed | C1 for a correct error identified<br>C1 for a correct error identified |
| 5 a | | graph | M1 for method to start to find distance cycled in 36 mins, eg. line drawn of correct gradient or $15 \times \frac{36}{60}$<br>C1 for correct graph from 9.00 am to 9.36 am<br>C1 for graph drawn from "(9.36, 9)" to (10.45, "9" + 8) |
| b | | 4.5 | M1 for 18 × 0.25oe<br>A1 cao |
| 6 | | 8112 | M1 for complete method, eg. $7500 \times 1.04^2$<br>A1 cao |

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| 7 | | No with supporting evidence | P1 for the start of a correct process, eg. two of $x$, $2x$ and $2x+7$ oe or a fully correct trial, eg. 5 + 10 + 17 = 32<br>P1 for setting up an equation in $x$. eg. $x + 2x + 2x + 7 = 57$ or a correct trial totalling 57, eg. 10 + 20 + 27 = 57<br>C1 (dep on P2) for at least one correct result and for a correct deduction from their answers found, eg. Chris has 20 so it is impossible for all to have 20 since 60 marbles would be needed. |
| 8 | | 66.9 | P1 for process to find the area of one shape, eg. 19×16 (= 304) or $\pi \times 8^2$ (= 201.06...)<br>P1 for process to find the shaded area, eg. "304" – "201.06" ÷2 (= 203.46...)<br>P1 for a complete process to find required percentage, eg. $\frac{"203.46"}{304} \times 100$<br>A1 for answer in range 66 to 68 |
| 9 | | 135 | B1 for identifying the angle of $70^o$ (on the diagram), showing understanding of notation<br>P1 for process to find an angle in triangle *ABC,* eg. for process to find angle *BAC*, eg. (180 – 50) ÷ 2 (= $65^o$)<br>A1 for 135 |

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| 10 a | | –1.5 | M1 for method to find gradient, eg. 210 ÷ 140<br>A1 for correct interpretation of the negative gradient |
| b | | | C1 for explanation, eg. rate of change of depth of water in tank |
| 11 a | | 0.49 | M1 for 0.7 × 0.7<br>A1 for 0.49 oe |
| b | | 0.51 | M1 for a correct process, eg. 1 – "0.49" or 0.7 × 0.3 + 0.3× 0.7 + 0.3 × 0.3<br>A1 for 0.51 oe |
| 12 a | | 0.4 | B1 For 0.4 oe |
| b | | 0.586 | B1 for 3.48207..... or 17.34 or 0.200811...<br>B1 for 0.585 to 0.586 |
| 13 | | Fully correct algebra to show given result | M1 for method to find the product of any two linear expressions; eg. 3 correct terms or 4 terms ignoring signs<br>M1 for method of 6 products, 4 of which are correct (ft their first product)<br>A1 for fully accurate working to give the required result |

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| 14 | | 33.8 | P1 for recognition of similar triangles or equal ratio of sides<br>P1 for process to find *CB*, eg. $\frac{5}{13} = \frac{13}{CB}$<br>A1 for 33.8 |
| 15 | | 18.3 | P1 for a start to the process interpreting the information correctly, eg. $T = k\sqrt{L}$ oe<br>P1 for next stage in process to find percentage change in *T*, eg. √1.4<br>A1 for 18.3 to 18.4 |
| 16 | | 84 | M1 for correct interpretation of given information leading to a method to find fd, eg. 20 ÷ 100 (thousand)<br>P1 for start of process to find required frequency, eg. 0.8 × 50 (= 40) or 0.6 × 50 (= 30) or 0.14 × 100 (= 14)<br>A1 for 84 cao |
| 17 | | $n^2 - n + 1$ oe | M1 for correct deduction from differences, eg. 2nd difference of 2 implies $1n^2$ or sight of $1^2, 2^2, 3^2, ..$<br>M1 for sight of $1^2, 2^2, 3^2, ..$ linked with 1, 2, 3, ...<br>A1 for $n^2 - n + 1$ oe |

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| 18 | | $3x^2 + 10x$ | M1 start a chain of reasoning, eg. $3(x+2)^2 - 2(x+2) - 8$<br>M1 continue chain by expanding brackets correctly, eg. $3x^2 + 12x + 12 - 2x - 4 - 8$<br>A1 for $3x^2 + 10x$ ($a = 3$, $b = 10$) |
| 19 | | 8.63 to 8.65 | P1 for a start of process, eg. $0.5x(x-2) = 2.5$<br>P1 for rearranging to give a quadratic equation, eg $x^2 - 2x - 5 = 0$ oe.<br>P1 for a process to solve the quadratic equation, condoning one sign error in use of formula ($x$ = 3.449... and $x$ = –1.449...)<br>P1 for selecting the positive value of $x$ and applying Pythagoras to find the hypotenuse, eg. $\sqrt{(3.449^2 + 1.449^2)}$ (= 3.74...)<br>P1 for complete process to find perimeter<br>A1 for answer in the range 8.63 to 8.65 |

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| 20 a | | 3 to 4 | C1 for a tangent drawn at $t = 6$<br>B1 for answer in range 3 to 4 |
| b | | 452 | C1 for splitting the area into 3 strips and a method of finding the area of one shape under the graph, eg. $\frac{1}{2} \times 4 \times 35$ (= 70)<br>M1 for complete process to find the area under the graph, eg "70" + $\frac{1}{2} \times 4 \times (35 + 51)$ (= 172) + $\frac{1}{2} \times 4 \times (51 + 54)$ (= 210) [ = 452]<br>A1 for 452 |
| 21 | | 10169 or 10170 | P1 for correct use of formula to find number in 2016, eg. 1.05(9500 – 250) (= 9712.5)<br>P1 for complete iterative process,<br>eg. 2017: 1.05(9712.5 – 250) (= 9935.625)<br>2018: 1.05(9935.625 – 250)<br>C1 for answer of 10169.90... correctly rounded or truncated to nearest whole number |
| 22 | | 1.5 | B1 for any correct bound clearly identified,<br>eg. 99.65 →$x$ → 99.75<br>or 66.5 → $y$→ 67.5<br>M1 for method to find UB, eg. "99.75" ÷ "66.5"<br>A1 for 1.5 |

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| 23 | | $y = -\frac{4}{3}x + \frac{25}{3}$ oe | M1 for method to find gradient of tangent, eg. $-1 \div \frac{3}{4} = -\frac{4}{3}$<br>M1 for method to find $y$-intercept using $y =$ "$-\frac{4}{3}$"$x + c$<br>A1 $y = -\frac{4}{3}x + \frac{25}{3}$ oe |
| 24 | | Proof | C1 for joining $AO$ (extended to $D$) and considering angles in two triangles (algebraic notation may be used here)<br>C1 for using isosceles triangle properties to find angle $BOD$ (eg. $x + x = 2x$) or angle $COD$ (eg. $y + y = 2y$)<br>C1 for angle $BOC = 2x + 2y$ [= 2×angle $BAO$ + 2×angle $CAO$]<br>C1 for completion of proof with all reasons given, eg. base angles of isosceles triangle are equal and sum of angles at a point is $360^o$ |