

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |  |                                       |                    |      |                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|--|---------------------------------------|--------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |  | Working                               | Answer             | Mark | Notes                                                                                                                                                                                                      |
| 1.                                                                       |  | $2^5 = 32 = 2^5$                      | $64^0$             | 3    | M1 for writing numbers as whole numbers or as consistent powers with a least 3 correct.                                                                                                                    |
|                                                                          |  | $64^{\frac{1}{2}} = 8 = 2^3$          | $8^{\frac{1}{3}}$  |      | M1 for writing numbers as whole numbers or as consistent powers with a least 5 correct.                                                                                                                    |
|                                                                          |  | $4^3 = 64 = 2^6$                      | $64^{\frac{1}{2}}$ |      | A1 for correct order with no incorrect statements.                                                                                                                                                         |
|                                                                          |  | $8^{\frac{1}{3}} = 2$                 | $2^5$              |      |                                                                                                                                                                                                            |
| 2.                                                                       |  | $16 = 2^4$                            | $4^3$              | 4    | M1 for 1 – 0.4 – 0.3 – 0.16 or 100 – 40 – 30 – 16                                                                                                                                                          |
|                                                                          |  | $64^0 = 1 = 2^0$                      |                    |      | A1 for 0.14 oe                                                                                                                                                                                             |
|                                                                          |  |                                       |                    |      | M1 for "0.14" × 50 oe                                                                                                                                                                                      |
|                                                                          |  |                                       |                    |      | A1 for 7 or ft "0.14" × 50                                                                                                                                                                                 |
| 3.                                                                       |  |                                       | 7                  | 3    | M1 for listing multiples of 20 and 24 with at least 3 numbers in each list ; multiples could be given in minutes or in hours and minutes (condone one addition error in total in first 3 numbers in lists) |
|                                                                          |  | Acton after 24, 48, 72, 96, 120       | 11:00 a.m.         |      | A1 identify 120 (mins) <b>or</b> 2 (hours) as LCM                                                                                                                                                          |
|                                                                          |  | Barton after 20, 40, 60, 80, 100, 120 |                    |      | A1 for 11:00 (a.m.) <b>or</b> 11 (a.m.) <b>or</b> 11 o'clock                                                                                                                                               |
|                                                                          |  | LCM of 20 and 24 is 120               |                    |      |                                                                                                                                                                                                            |
|                                                                          |  | 9:00 a.m. + 120 minutes               |                    |      |                                                                                                                                                                                                            |
|                                                                          |  |                                       |                    |      |                                                                                                                                                                                                            |
|                                                                          |  |                                       |                    |      |                                                                                                                                                                                                            |
|                                                                          |  |                                       |                    |      |                                                                                                                                                                                                            |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |                                                                                                                                                        |        |      |                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 | Working                                                                                                                                                | Answer | Mark | Notes                                                                                                                                                                                                                                                                                                                     |
| 4.                                                                       | $(2x - 3 + 2x + 3) \div 2 \times 4$<br>$= 18$<br><br>$8x = 18$<br><br>$x = 2.25$<br><br>$P = 2x - 3 + 2x + 3 + 5 + 5$<br>$P = 4x + 10$<br>$P = 9 + 10$ | 19 cm  | 6    | M1 for $(2x - 3 + 2x + 3) \div 2 \times 4$ oe<br><br>M1 for equating " $(2x - 3 + 2x + 3) \div 2 \times 4$ " = 18<br><br>A1 cao $x = 2.25$ oe (eg. $\frac{18}{8}$ )<br><br>M1 (indep) $2x - 3 + 2x + 3 + 5 + 5$ (= $4x + 10$ ) oe<br><br>M1 (dep) for substituting "x" into an expression for the perimeter<br><br>A1 cao |
| 5.                                                                       |                                                                                                                                                        | £500   | 3    | M1 for $70\% = 350$ or $\frac{350}{70}$<br><br>M1 for $\frac{350}{70} \times 100$ oe<br><br>A1 cao                                                                                                                                                                                                                        |
| 6.                                                                       | $\frac{7 \times 200}{0.05} = \frac{1400}{0.05}$                                                                                                        | 28000  | 3    | B1 for any two of 7, 200 or 0.05<br><br>M1 for correct processing of at least two of 7, 200 or 190 and 0.05 or 0.1<br><br>A1 in the range 26600 – 28000                                                                                                                                                                   |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |     |                                                                      |                        |      |                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|-----|----------------------------------------------------------------------|------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |     | Working                                                              | Answer                 | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                      |
| 7.                                                                       |     | $(7 \times 2 + 2 \times 5) \times 200 = 4800$<br><br>$4800 \times 8$ | 38 400 g               | 5    | M1 for $7 \times 2$ or $2 \times 5$ or $7 \times 7$ or $5 \times 5$ or $2 \times 2$<br><br>M1 for “ $7 \times 2$ ” + “ $2 \times 5$ ” oe or “ $7 \times 7$ ” – “ $5 \times 5$ ”<br><br>M1 (dep on 1 <sup>st</sup> M) for ‘24’ $\times$ 200 or ‘0.0024’ $\times$ 2<br><br>M1 for ‘4800’ $\times$ 8 or ‘0.0048’ $\times$ 8 000 000 or ‘0.0048’ $\times$ 8000<br><br>A1 for 38 400g or 38.4kg |
| 8.                                                                       |     |                                                                      | $y = \frac{1}{2}x - 5$ | 3    | M1 for method to find gradient of $L_1$ e.g $\frac{6-3}{6-0} \left( = \frac{1}{2} \right)$<br><br>M1 for $y = “\frac{1}{2}”x + c$ or $y = mx - 5$ ( $c, m$ do not have to be numerical, or correct numerical values) or for $(L =) \frac{1}{2}x - 5$<br><br>A1 $y = \frac{1}{2}x - 5$ oe                                                                                                   |
| 9.                                                                       | (a) | 1, 2, 3, 5, 6, 9, 10, 11                                             | $\frac{8}{11}$         | 2    | M1 for indicating $A \cup B$ (could be by listing or shading etc)<br><br>A1 for $\frac{8}{11}$                                                                                                                                                                                                                                                                                             |
|                                                                          | (b) | 1, 3, 4, 6, 7, 8, 11                                                 | $\frac{7}{11}$         | 2    | M1 for indicating $B^c$ (could be by listing or shading etc)<br><br>A1 for $\frac{7}{11}$                                                                                                                                                                                                                                                                                                  |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |     |         |                                                              |      |                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|-----|---------|--------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |     | Working | Answer                                                       | Mark | Notes                                                                                                                                                                                                                                         |
| 10.                                                                      | (a) |         | reflection in $x = 5$                                        | 2    | B1 for reflection<br><br>B1 for $x = 5$                                                                                                                                                                                                       |
|                                                                          | (b) |         | rectangle with vertices<br>(1, 3), (1, 6), (7, 6),<br>(7, 3) | 2    | M1 for enlargement sf 3<br><br>A1 for fully correct answer                                                                                                                                                                                    |
|                                                                          | (c) |         | 90° clockwise,<br>centre (0, 0)                              | 3    | B2 90° clockwise or 270° anticlockwise<br><br>(B1 90° or 270° stated without direction or with incorrect direction or correct translation of S shown)<br><br>B1 centre (0,0)                                                                  |
| 11.                                                                      |     |         | (4,3), (4,4), (4,5),<br>(5,4)<br>marked                      | 3    | M2 for identifying the correct region or at least 3 correct points with no more than 3 incorrect points<br><br>(M1 for drawing $x = 3$ (solid or dashed line) or at least 1 correct point with no more than 3 incorrect points)<br><br>A1 cao |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |  |         |             |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------|--|---------|-------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |  | Working | Answer      | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 12.                                                                      |  |         | 62          | 4    | <p>M1 for B to C time = <math>210 \div 70</math> (= 3 h)</p> <p>M1 for A to B dist = <math>(5 - "3") \times 50</math> (= 100)</p> <p>M1 (dep on M1) for average speed = total distance <math>\div</math> total time<br/>or <math>210 + "(2 \times 50)" \div 5</math></p> <p>A1 cao</p>                                                                                                                                                                                                                                                                       |
| 13.                                                                      |  |         | $128^\circ$ | 4    | <p>M1 for <math>180 - 116</math> (= 64), when clearly attempting to find angle <i>ADC</i></p> <p>M1 (indep) for their angle <i>ADC</i> <math>\times 2</math></p> <p>C2 (dep on M2) for <math>x = 128^\circ</math> and fully correct reasons supported by method:<br/>eg. "<u>opposite angles</u> of a <u>cyclic quadrilateral</u> add up to <u><math>180^\circ</math></u>"<br/>and "<u>the angle</u> at the <u>centre</u> of a circle is <u>twice the angle</u> at the <u>circumference</u>"</p> <p>[C1 (dep on the relevant M1) for one correct reason]</p> |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |     |                                                                                                                              |                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------|-------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |     | Working                                                                                                                      | Answer            | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 14.                                                                      | (a) | $4^2 + 3 \times 4 - 2$                                                                                                       | 26                | 2    | M1 for substituting 4 into the expression, e.g. $4^2 + 3 \times 4 - 2$<br><br>A1 cao                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | (b) | $  \begin{array}{cccccc}  1 & 7 & 17 & 31 & 49 \\  & 6 & 10 & 14 & 18 \\  & & 4 & 4 & 4 \\  & & & & 2n^2 + c  \end{array}  $ | $2n^2 - 1$        | 3    | M1 for correct method to find second differences<br><br>M1(dep) for $2n^2 + bn + c$<br><br>A1 for $2n^2 - 1$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 15.                                                                      |     | $  \begin{array}{ccc}  50 & 1 & 1 \\  1 & 50 & 1 \\  1 & 1 & 50  \end{array}  $                                              | $\frac{126}{720}$ | 4    | M1 for 3 fractions $\frac{a}{10}, \frac{b}{9}, \frac{c}{8}$ where $a < 10, b < 9$ and $c < 8$<br><br>M1 for $\frac{7}{10} \times \frac{3}{9} \times \frac{2}{8}$ or $\frac{3}{10} \times \frac{7}{9} \times \frac{2}{8}$ or $\frac{3}{10} \times \frac{2}{9} \times \frac{7}{8}$<br>(= $\frac{42}{720}$ )<br><br>M1 for $\frac{7}{10} \times \frac{3}{9} \times \frac{2}{8} + \frac{3}{10} \times \frac{7}{9} \times \frac{2}{8} + \frac{3}{10} \times \frac{2}{9} \times \frac{7}{8}$<br><br>or $3 \times \frac{3}{10} \times \frac{2}{9} \times \frac{7}{8}$<br><br>A1 for $\frac{126}{720}$ (oe, e.g. $\frac{7}{40}$ ) |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |  |                                          |                   |      |                                                                                            |
|--------------------------------------------------------------------------|--|------------------------------------------|-------------------|------|--------------------------------------------------------------------------------------------|
| Question                                                                 |  | Working                                  | Answer            | Mark | Notes                                                                                      |
| 16.                                                                      |  | $M = kL^3$                               | 540               | 4    | M1 for $M \propto L^3$ or $M = kL^3$                                                       |
|                                                                          |  | $k = \frac{M}{L^3} = \frac{160}{8} = 20$ |                   |      | A1 $k = 20$                                                                                |
| 17.                                                                      |  | When $L = 3$ , $M = 20 \times 3^3$       | $x = 4$ , $x = 0$ | 4    | M1 for $x^2 - 2x + 1 - 2x + 2 - 3 = 0$ ; condone one sign error in the complete expansion  |
|                                                                          |  |                                          |                   |      | M1 for $x^2 - 4x = 0$                                                                      |
|                                                                          |  |                                          |                   |      | M1 (dep on M1) for a correct method to solve their quadratic equation, e.g. $x(x - 4) = 0$ |
|                                                                          |  |                                          |                   |      | A1 cao for $x = 4$ and $x = 0$                                                             |

| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |     |                                                                                                                      |                                                                        |      |                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 |     | Working                                                                                                              | Answer                                                                 | Mark | Notes                                                                                                                                                                                                                                                                                                           |
| 18.                                                                      | (a) |                                                                                                                      | $\mathbf{b - a}$                                                       | 1    | B1                                                                                                                                                                                                                                                                                                              |
|                                                                          | (b) |                                                                                                                      | $\overrightarrow{BM} = \frac{1}{2} \overrightarrow{OC}$ hence parallel | 4    | B1 $\overrightarrow{OC} = \mathbf{a + b}$<br>M1 $\overrightarrow{BM} = \overrightarrow{BC} + \overrightarrow{CM}$ oe<br>or $\overrightarrow{BM} = \mathbf{a + \frac{1}{2} ("b - a")}$<br><br>A1 $\frac{1}{2} (\mathbf{a + b})$<br><br>C1 $\overrightarrow{BM} = \frac{1}{2} \overrightarrow{OC}$ hence parallel |
| 19.                                                                      |     | $x^2 + (x + 1)^2$ $= x^2 + x^2 + 2x + 1$ $= 2x^2 + 2x + 1$ $= \text{even} + \text{even} + \text{odd}$ $= \text{odd}$ | proof                                                                  | 3    | M1 for $x^2 + (x + 1)^2$ or $(x - 1)^2 + x^2$ oe<br><br>M1 for correctly expanding $(x + 1)^2$ or $(x - 1)^2$<br><br>C1 for simplifying correctly and for final explanation and states $x$ is an integer, e.g. $2(x^2 + x)$ is even and 1 is odd <b>and</b> even + odd is odd                                   |



| 1MA1 Practice papers Set 4: Paper 1H (Regular) mark scheme – Version 1.0 |                                                                                                                                                                                            |                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question                                                                 | Working                                                                                                                                                                                    | Answer              | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 20.                                                                      | $\frac{8 - \sqrt{18}}{\sqrt{2}} = \frac{8}{\sqrt{2}} - \frac{\sqrt{18}}{\sqrt{2}}$ $= \frac{8}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} - \sqrt{\frac{18}{2}}$ $\frac{8\sqrt{2}}{2} - 3$ | $a = -3$<br>$b = 4$ | 3    | <p>M1 for attempt to rationalise denominator,<br/> e.g. <math>\frac{8}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} - \frac{\sqrt{18}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}</math> or <math>\frac{8 - \sqrt{18}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}</math></p> <p>Or <math>8 - \sqrt{18} = \sqrt{2}(a + b\sqrt{2})</math> (oe)</p> <p>A2 for <math>-3 + 4\sqrt{2}</math></p> <p>(A1 for <math>-3</math>, A1 for <math>4</math>)</p> |

National performance data from Results Plus

|    | Original source of questions |       |                 |      |                                        |              | Mean score of students achieving grade: |      |      |      |      |      |      |
|----|------------------------------|-------|-----------------|------|----------------------------------------|--------------|-----------------------------------------|------|------|------|------|------|------|
| Qn | Spec                         | Paper | Session<br>YYMM | Qn   | Topic                                  | Max<br>score | ALL                                     | A*   | A    | B    | C    | D    | E    |
| 1  | 5MM1                         | 1H    | 1506            | Q17  | Index laws                             | 3            | 2.01                                    | 2.92 | 2.71 | 2.15 | 1.26 | 0.56 | 0.27 |
| 2  | 5MM1                         | 1H    | 1411            | Q07  | Probability                            | 4            | 2.85                                    | 3.61 | 3.55 | 3.18 | 2.59 | 1.92 | 0.80 |
| 3  | 1MA0                         | 1H    | 1206            | Q07  | HCF and LCM                            | 3            | 2.00                                    | 2.77 | 2.43 | 2.20 | 1.87 | 1.20 | 0.58 |
| 4  | 5MM1                         | 1H    | 1106            | Q14  | Solve linear equations                 | 6            | 2.02                                    | 5.71 | 4.15 | 2.19 | 0.50 | 0.30 | 0.14 |
| 5  | 1MA0                         | 1H    | 1306            | Q16  | Percentages                            | 3            | 1.02                                    | 2.79 | 2.07 | 1.28 | 0.60 | 0.20 | 0.10 |
| 6  | 1380                         | 1H    | 906             | Q14  | Estimation                             | 3            | 1.61                                    | 2.54 | 2.00 | 1.59 | 1.25 | 0.77 | 0.33 |
| 7  | 1380                         | 1H    | 1106            | Q10  | Compound measures                      | 5            | 2.20                                    | 4.13 | 3.30 | 2.31 | 1.22 | 0.51 | 0.29 |
| 8  | 1MA0                         | 1H    | 1406            | Q19  | Gradients                              | 3            | 0.62                                    | 2.65 | 1.76 | 0.56 | 0.08 | 0.01 | 0.00 |
| 9  | 5MM1                         | 1H    | 1206            | Q17  | Venn diagrams                          | 4            | 1.26                                    | 2.68 | 1.84 | 0.92 | 0.53 | 0.25 | 0.07 |
| 10 | 5MM1                         | 1F    | 1311            | Q26  | Transformations                        | 7            | 1.69                                    | 6.00 | 5.00 | 4.00 | 3.43 | 2.25 | 1.36 |
| 11 | 1MA0                         | 1H    | 1211            | Q17  | Solve inequalities                     | 3            | 0.28                                    | 2.37 | 1.24 | 0.31 | 0.06 | 0.02 | 0.02 |
| 12 | 2MB01                        | 2H    | 1406            | Q13  | Average speed                          | 4            | 1.96                                    | 3.60 | 2.89 | 2.29 | 1.57 | 0.65 | 0.27 |
| 13 | 2MB01                        | 3H    | 1311            | Q18  | Circle theorems                        | 4            | 1.66                                    | 3.44 | 2.80 | 1.72 | 0.71 | 0.23 | 0.06 |
| 14 | 5MM1                         | 1H    | 1311            | Q14  | Number sequences                       | 5            | 2.27                                    | 4.76 | 3.70 | 2.72 | 1.33 | 0.37 | 0.12 |
| 15 | 1MA0                         | 1H    | 1306            | Q26  | Selection with and without replacement | 4            | 0.63                                    | 3.04 | 1.78 | 0.61 | 0.11 | 0.01 | 0.00 |
| 16 | 1380                         | 1H    | 906             | Q21  | Direct and inverse proportion          | 4            | 1.81                                    | 3.88 | 3.27 | 1.62 | 0.51 | 0.10 | 0.03 |
| 17 | 5MM1                         | 1H    | 1411            | Q20  | Solve quadratic equations              | 4            | 0.92                                    | 3.72 | 1.80 | 0.70 | 0.11 | 0.00 | 0.00 |
| 18 | 5MM1                         | 1H    | 1306            | Q24  | Vectors                                | 5            | 1.24                                    | 3.63 | 1.94 | 0.96 | 0.32 | 0.06 | 0.00 |
| 19 | 5MM1                         | 1H    | 1206            | Q24  | Algebraic proof                        | 3            | 0.53                                    | 2.09 | 0.96 | 0.20 | 0.03 | 0.00 | 0.00 |
| 20 | 1380                         | 1H    | 1106            | Q22b | Surds                                  | 3            | 0.27                                    | 1.30 | 0.38 | 0.12 | 0.06 | 0.04 | 0.03 |
|    |                              |       |                 |      |                                        | 80           |                                         |      |      |      |      |      |      |