

1MA1 Practice Tests Set 1: Paper 2H (Regular) mark scheme – Version 1.0

| Question | | Working | Answer | Mark | Notes |
|----------|----------------|--|-------------------------|------------|--|
| 1 | | | 488 | 3 | M1 600×67.1 (= 40260) or $67.1 \div 82.5$ (= 0.813...) M1 (dep) “40260” $\div 82.5$ or “0.813..” $\times 600$ A1 cao SC: B2 for 712 |
| 2 | | 12, 24, 36, 48, 60, 72, 8, 16, 24, 32, 40, 48, 56, 64, 72,... | 25.80 | 5 | M1 for listing at least 3 multiples of each of 12 and 8 or 24 in two lists of multiples or from factor trees M1 (dep) for attempt to find a common multiple of 12 and 8 above 60 (= 72) M1 (dep M2) for method to find the number of boxes and the number of packs $72 \div 12$ (= 6) and $72 \div 8$ (= 9) M1 for finding the total cost by multiplying numbers by cost and adding eg “6” $\times 2.50$ + “9” $\times 1.20$ A1 for 25.8(0) |
| 3 | | $62 + 92 = 117$ $\sqrt{117} =$ | 10.8 | 3 | M1 for $62 + 92$ M1 for $\sqrt{(36 + 81)}$ or $\sqrt{117}$ A1 for 10.8 – 10.82 |
| 4 | (a) (b) | | Negative 117–123 | 1 2 | B1 cao M1 for a line of best fit drawn between (9,130) and (9, 140) and between (13,100) and (13,110) inclusive A1 for 117 – 123 |
| 5 | | $x + 4x > 2(x + 48)$ $5x > 2x + 96$ $3x > 96$ | 33 | 5 | B1 for $x + 48$ (or $2x + 96$ oe) and $4x$ M1 for $x + 4x > 2(x + 48)$ oe M1 for subtracting $2x$ from both sides |

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|----------|---|-------------------------------------|----------|---|---------|----|----|----|----|----|-----|----|----|----|-----|-----|----|----|-----|-----|-----|----|----|-----|-----|-----|----|----|-----|-----|-----|--|--|---|
| | $x > 32$ OR <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>S</th> <th>N</th> <th>C</th> <th>S+ C</th> <th>2N</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>58</td> <td>40</td> <td>50</td> <td>116</td> </tr> <tr> <td>20</td> <td>68</td> <td>80</td> <td>100</td> <td>136</td> </tr> <tr> <td>30</td> <td>78</td> <td>120</td> <td>140</td> <td>156</td> </tr> <tr> <td>32</td> <td>80</td> <td>128</td> <td>160</td> <td>160</td> </tr> <tr> <td>33</td> <td>81</td> <td>132</td> <td>165</td> <td>166</td> </tr> </tbody> </table> | S | N | C | S+ C | 2N | 10 | 58 | 40 | 50 | 116 | 20 | 68 | 80 | 100 | 136 | 30 | 78 | 120 | 140 | 156 | 32 | 80 | 128 | 160 | 160 | 33 | 81 | 132 | 165 | 166 | | | A1 for $3x > 96$ oe A1 cao for 33 OR Trial and Improvement B1 for 1 correct trial of S, N and C M1 for an improved correct trial of S, N and C M1 for a correct trial of 32 M1 for a correct trial of 33 A1 (dep on M2) for 33 cao NB: Accept other letters instead of x NB: an answer of 32 without working scores 0 marks |
| S | N | C | S+ C | 2N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 58 | 40 | 50 | 116 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 68 | 80 | 100 | 136 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 78 | 120 | 140 | 156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | 80 | 128 | 160 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | 81 | 132 | 165 | 166 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | $4x + 4x + 3x + 4 + 3x + 4$ $= 14x + 8$ $5x + 5x + x - 3 + 7x - 3$ $= 18x - 6$ $18x - 6 = 14x + 8$ $4x = 14$ $x = 14/4 = 3.5$ oe | $x = 3.5$ $L = 14.5$ $W = 14$ | 6 | M1 $4x + 4x + 3x + 4 + 3x + 4 (= 14x + 8)$ M1 $5x + 5x + x - 3 + 7x - 3 (= 18x - 6)$ M1 equating e.g. $18x - 6 = 14x + 8$ ($4x = 14$) A1 $x = 14/4 = 3.5$ oe A1 for 14.5 or “3.5” \times 3+4 ft A1 for 14 or “3.5” \times 4 ft | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | Area of trapezium = Length is $3x + 4 =$ $3 \times 3.5 + 4 =$ Width is $4x = 4 \times 3.5 =$ | | | |
| 7 | (a) *(b) | | 0.22,0.78,0.74,0.26 No As $0.454 < 0.5$ | 2 4 | B1 for 0.78,0.22 correctly placed B1 for 0.26,0.74 correctly placed M1 for $0.55 \times "0.22"$ or $0.45 \times "0.74"$ oe M1 for $0.55 \times "0.22" + 0.45 \times "0.74"$ oe A1 for 0.454 oe C1 (dep on M1) for conclusive statement based on their answer compared to 50% |
| 8 | | $2y - - y = 3 - 6$ or $x + 2x = 3 + 12$ | $x = 5, y = -1$ | 3 | M1 for a complete method to eliminate one variable (condone one arithmetic error) A1 $x = 5$ A1 $y = -1$ NB: Candidates showing no working score 0 marks |

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| 9 | | 28% or $\frac{14}{50}$ | 4 | <p>M1 for $100 - 30 (= 70)$ or $1 - \frac{3}{10} \left(= \frac{7}{10} \right)$</p> <p>M1 for “70” $\div (3 + 2) (= 14)$ or $\frac{7}{10} \div (3 + 2) \left(= \frac{7}{50} \right)$</p> <p>M1 for “14” $\times 2$ or $\frac{7}{50} \times 2$</p> <p>A1 for 28% or $\frac{14}{50}$ oe</p> <p>OR</p> <p>M1 for a correct method to find $(100 - 30)\%$ of any actual sum of money</p> <p>M1 for “350” $\div (3 + 2) (= 70)$</p> <p>M1 for “70” $\times 2$</p> <p>A1 for 28% or $\frac{14}{50}$ oe</p> <p>OR</p> <p>M1 for starting with two numbers in ratio 3:2, e.g. 21 and 14</p> <p>M1 for equating sum of their numbers to $100 - 30 (= 70\%)$, e.g. ‘21’ + ‘14’ $(= 35)$</p> <p>M1 for scaling sum of their numbers to 100%, e.g. ‘35’ $\div 70 \times 100 (= 50)$</p> |

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| | | | | | A1 for 28% or $\frac{14}{50}$ oe SC: award B3 for oe answers expressed in an incorrect form e.g. $\frac{2.8}{10}$ |
| 10 | | 5, 13, 29, 53, 85, 125 | (85) | 2 | M1 for correct evaluation of at least 3 odd cases or sequence of 5, (8), 13, (20), 29... seen or the expression with $n = 9$ or 11 or 19 or 21 or ... substituted but not evaluated A1 for 85 or 125 or 365 or 445 or ... identified |
| 11 | (a) | | 104.5° | 3 | M1 for substitution into the cosine rule e.g. $3.6^2 = 1.8^2 + 2.7^2 - 2 \times 1.8 \times 2.7 \times \cos A$ M1 for $\cos A = \left(\frac{1.8^2 + 2.7^2 - 3.6^2}{2 \times 1.8 \times 2.7} \right)$ [= $\left(\frac{3.24 + 7.29 - 12.96}{9.72} \right) = (-0.25)]$ A1 for 104.47..... |
| | (b) | | 2.4 | 2 | M1 (ft) for $\frac{1}{2} \times 1.8 \times 2.7 \times \sin(a)$ A1 for an answer in the range 2.3 to 2.4 or ft from their (a) if supported by correct working. |

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| *12 | d : UB = 190.5 (190.49..) LB = 189.5 f : UB = 25.75 (25.749..) LB = 25.65 | 7.4 because the LB and UB agree to that number of figures | 5 | B1 for one correct bound of d B1 for one correct bound of f M1 for a correct method to find the upper bound of c , e.g. "190.5" + "25.65" (= 7.4269....) or for a correct method to find the lower bound of c , e.g. "189.5" + "25.75" (= 7.359....) A1 for 7.42(69...) and 7.35(92...) C1 (dep on M1) for a statement that both LB and UB round to "7.4" to one decimal place oe NB an answer of 7.39(2996...) or 7.4 without working or from $190 \div 25.7$ scores no marks |
| 13 | Volume of A = $\frac{140}{0.7}$ = 200 Volume of B = $\frac{128}{1.6} = 80$ Mass of C = 140 + 128 = 268 Density of C = $\frac{268}{280}$ | 0.957 | 4 | M1 for finding the volume of either liquid A or B or the mass of liquid C M1 for a complete method to find the volume AND mass of liquid C M1 (dep M2) for "total mass" ÷ "total volume" A1 for 0.957 to 0.96 |

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| 14 | (a) | 11 | 1 | B1 cao |
| | (b) | $\frac{x-5}{2}$ | 2 | M1 for a correct first stage: subtract 5 from both sides or divide all terms by 2 NB Accept f(x) in place of y A1 $\frac{x-5}{2}$ (oe) |
| | (c) | -16 | 1 | B1 cao |
| | (d) | $4x^2 + 20x$ | 5 | M1 |
| | (i) | $4x^2 + 10x + 10x + 25$ oe | | B1 for correct expansion of $(2x + 5)^2$ A1 $4x^2 + 20x$ or a correct fully or partially factorised expression |
| (ii) | | $x = 0, x = -5$ | | M1 $4x(x+5) (= 0)$ or $x(4x + 20) (= 0)$ or $2x(2x + 10) (= 0)$ $\frac{-20 \pm \sqrt{20^2 - 4 \times 4 \times 0}}{2 \times 4}$ or $x(x + 5) (= 0)$ or for, e.g. A1 for both solutions |

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| 15 | $\frac{5}{20} \times \frac{7}{19} + \frac{5}{20} \times \frac{8}{19} +$ $\frac{7}{20} \times \frac{5}{19} + \frac{7}{20} \times \frac{8}{19} +$ $\frac{8}{20} \times \frac{5}{19} + \frac{8}{20} \times \frac{7}{19}$ OR $\left(\frac{5}{20} \times \frac{15}{19} + \frac{7}{20} \times \frac{13}{19} + \frac{8}{20} \times \frac{12}{19} \right)$ OR 1 – $\left(\frac{5}{20} \times \frac{4}{19} + \frac{7}{20} \times \frac{6}{19} + \frac{8}{20} \times \frac{7}{19} \right)$ | | 4 | M1 for at least one product of the form $\frac{a}{20} \times \frac{b}{19}$ M1 for identifying all products (condone 2 errors in 6 products, 1 error in 3 products) Either $\frac{5}{20} \times \frac{7}{19}, \frac{5}{20} \times \frac{8}{19}, \frac{7}{20} \times \frac{5}{19}, \frac{7}{20} \times \frac{8}{19}, \frac{8}{20} \times \frac{5}{19}, \frac{8}{20} \times \frac{7}{19}$ OR $\left(\frac{5}{20} \times \frac{15}{19}, \frac{7}{20} \times \frac{13}{19}, \frac{8}{20} \times \frac{12}{19} \right)$ OR $\left(\frac{5}{20} \times \frac{4}{19}, \frac{7}{20} \times \frac{6}{19}, \frac{8}{20} \times \frac{7}{19} \right)$ M1 (dep) for $\left(\frac{5}{20} \times \frac{7}{19} + \frac{5}{20} \times \frac{8}{19} + \frac{7}{20} \times \frac{5}{19} + \frac{7}{20} \times \frac{8}{19} + \frac{8}{20} \times \frac{5}{19} + \frac{8}{20} \times \frac{7}{19} \right)$ oe OR $\left(\frac{5}{20} \times \frac{15}{19} + \frac{7}{20} \times \frac{13}{19} + \frac{8}{20} \times \frac{12}{19} \right)$ oe OR 1 – $\left(\frac{5}{20} \times \frac{4}{19} + \frac{7}{20} \times \frac{6}{19} + \frac{8}{20} \times \frac{7}{19} \right)$ oe A1 for $\frac{131}{190}$ oe or 0.68947... correct to at least 2 decimal |

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| | | | | | places or answer that rounds to 0.69 NB : If decimals used for products then must be correct to at least 2 decimal places With replacement M0 M1 for identifying all products (condone 2 errors in 6 products, 1 error in 3 products) M1 (dep) A0 for $\frac{269}{400}$ oe or 0.655 (NB: $\frac{269}{400}$ oe or 0.655 implies M2) Partial replacement SC: B2 for $\frac{141}{200}$ oe or 0.705 or $\frac{121}{190}$ oe or 0.6368... correct to at least 2 decimal places |
| 16 | | $P = k/x^2$ $6 = k/5^2$ ($k = 150$) $P = \frac{150}{8^2}$ | 2.34 | 3 | M1 for $P = k/x^2$ or $P \propto k/x^2$ M1 for $6 = k/5^2$ or ($k =$) 150 seen or $6 \times 5^2 = P \times 8^2$ A1 2.34 |
| 17 | | $3^2 \times 180$ | 1620 | 2 | M1 for using a scale factor of 3^2 (= 9) A1 cao |

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| 18 | e.g. $1 \times 7.6 + 3 \times 9.4 +$ $2 \times 5.6 + 6 \times 1.4 = 55.4$ $55.4 \div 2 = 27.7$ $27.7 - 7.6 = 20.1$ $20.1 \div 9.4 = 2.138\dots$ Median = $55 + 2.138\dots$ $\times 2.5 = 60.345\dots$ | 60.3 | 4 | M1 for attempt to find the area of one bar M1 for attempt to find total area $\div 2$ (condone one error) M1 for correct attempt to locate median in second bar (condone one arithmetic error) A1 for 60.3(4...) |
| 19 | | (-15, 0) | 4 | M1 method to find gradient of tangent, e.g. $-1 \div -\frac{6}{3} (= \frac{1}{2})$ M1 for method to find equation of tangent with $m = \frac{1}{2}$ M1 for method to find x-axis intercept of tangent A1 cao |

National performance data from Results Plus

| Source of questions | | | | | | Mean score of students achieving grade: | | | | | | | | |
|---------------------|---------|-------|---------|-----|--------------------------------|---|------------|-----|------|------|-------------------|------|------|------|
| Qu | Spec | Paper | Session | Qu | Topic | Max score | Mean % all | ALL | A* | A | B | C | D | E |
| 1 | 4MA0(R) | 2F | 1501 | Q17 | Proportions | 2.30 | 3 | 77 | | | | 2.67 | 2.08 | 1.33 |
| 2 | 1MA0 | 2H | 1406 | Q14 | HCF and LCM | 3.68 | 5 | 74 | 4.65 | 4.27 | 3.97 | 3.58 | 2.77 | 1.58 |
| 3 | 5MM2 | 2F | 1211 | Q26 | Pythagoras in 2D | 1.00 | 3 | 33 | | | | 2.90 | 1.88 | 0.52 |
| 4 | 1380 | 2F | 911 | Q27 | Scatter diagrams | 1.66 | 3 | 55 | | | | 2.47 | 1.86 | 1.21 |
| 5 | 5AM2 | 2H | 1306 | Q14 | Solve inequalities | 2.71 | 5 | 54 | 4.43 | 3.48 | 2.78 | 1.72 | 0.79 | 0.06 |
| 6 | 5AM1 | 1H | 1106 | Q14 | Solve linear equations | 3.24 | 6 | 54 | 5.84 | 5.19 | 3.02 | 1.17 | 1.00 | 1.00 |
| 7 | 5AM2 | 2H | 1411 | Q15 | Probability tree diagrams | 3.22 | 6 | 54 | 5.78 | 5.25 | 4.29 | 2.36 | 1.00 | 0.00 |
| 8 | 4MA0(R) | 2F | 1501 | Q20 | Solving simultaneous equations | 0.72 | 3 | 24 | | | | 0.94 | 0.62 | 0.00 |
| 9 | 1MA0 | 2H | 1306 | Q07 | Ratio | 1.58 | 4 | 40 | 3.75 | 3.07 | 2.08 | 1.01 | 0.33 | 0.09 |
| 10 | 2540 | 2H | 811 | Q05 | Number sequences | 0.74 | 2 | 37 | 1.81 | 1.56 | 1.05 | 0.45 | 0.12 | 0.09 |
| 11 | 5MM2 | 2H | 1506 | Q21 | Sine and cosine rule | 1.59 | 5 | 32 | 4.38 | 2.58 | 0.80 | 0.16 | 0.05 | 0.10 |
| 12 | 5AM2 | 2H | 1406 | Q18 | Bounds | 1.57 | 5 | 31 | 3.53 | 2.65 | 1.45 | 0.44 | 0.10 | 0.00 |
| 13 | 1MA0 | 2H | 1506 | Q16 | Compound measures | 0.86 | 4 | 22 | 2.54 | 1.44 | 0.82 | 0.55 | 0.40 | 0.28 |
| 14 | 4MA0 | 1H | 1401 | Q20 | Functions | 4.76 | 9 | 53 | 7.89 | 5.68 | 3.42 | 1.41 | 0.47 | 0.25 |
| 15 | 1380 | 2H | 906 | Q26 | Conditional probability | 0.84 | 4 | 21 | 3.06 | 1.75 | 0.41 | 0.04 | 0.00 | 0.00 |
| 16 | 5MM2 | 2H | 1111 | Q23 | Direct and indirect proportion | 0.60 | 3 | 20 | 2.72 | 1.37 | 0.25 | 0.07 | 0.00 | 0.00 |
| 17 | 1MA0 | 2H | 1506 | Q21 | Ratio | 0.21 | 2 | 11 | 0.93 | 0.47 | 0.21 | 0.06 | 0.01 | 0.00 |
| 18 | 5AM1 | 1H | 1311 | Q21 | Histograms and grouped data | 0.42 | 4 | 11 | 2.04 | 0.67 | 0.23 | 0.12 | 0.00 | 0.00 |
| 19 | | | | NEW | | | 4 | | | | No data available | | | |
| | | | | | | | 80 | | | | | | | |