



THIRD SPACE
LEARNING

Mathematics

Paper 1

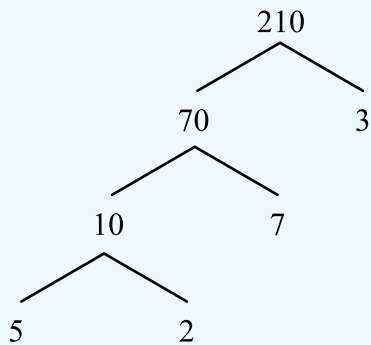
(Non-Calculator)

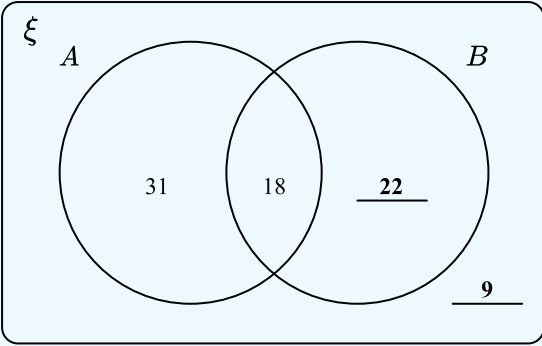
Higher Tier

Mark Scheme

AQA GCSE

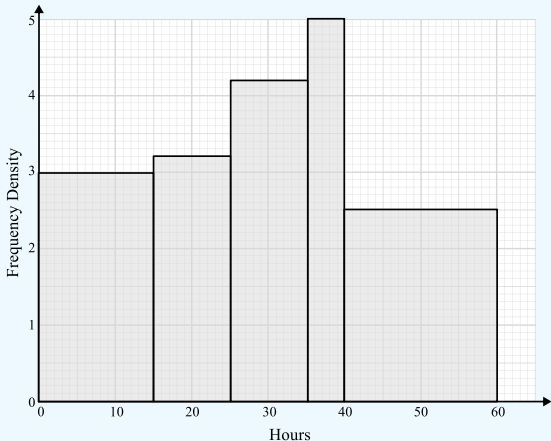
SET 5

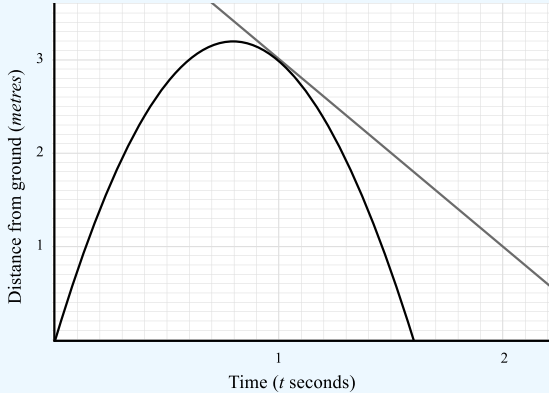
Question	Working	Answer	Notes
Q1a		0.72	
Q1b		$\frac{12}{7}$	B1 oe
Q2	 <pre> graph TD 210 --- 70 210 --- 3 70 --- 10 70 --- 7 10 --- 5 10 --- 2 </pre>	$2 \times 3 \times 5 \times 7$	M1 Correct prime factors identified A1 cao
Q3	$3.15 \times 10^4 = 31500$ $3.15 \times 10^{-2} = 0.0315$ $3.15 \times 10^{-1} = 0.315$ 3150 0.0315, 0.315, 3150, 31500	3.15×10^{-2} , 3.15×10^{-1} , 3150, 3.15×10^4	M1 Correctly converts at least two values A1 cao
Q4	360 = 60% 60 = 10% 600 = 100%	£600	M1 360 = 60% seen or implied A1 cao

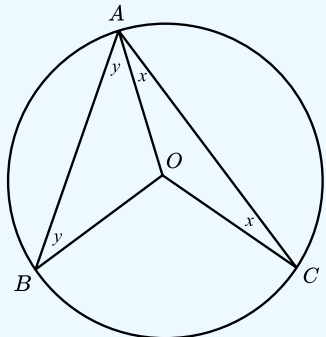
Question	Working	Answer	Notes
Q5a			M1 $40 - 18 = 22$ A1 Both values correct
Q5b		$\frac{18}{80}$	
Q6	Pentagon: $\frac{3 \times 180}{5} = 108$ Triangle: $\frac{180}{3} = 60$ $108 + 60 + 60 = 228$ $360 - 228 = 132$		M1 Interior angle of pentagon = 108 M1 $108 + 108 + 60 = 228$ A1 Full solution with no errors
Q7	Area A: $\pi \times (\sqrt{13})^2 = 13\pi$ Area B: $\frac{1}{3} \times \pi \times 6^2 = 12\pi$	A	M1 $\pi \times (\sqrt{13})^2$ or $\pi \times 6^2$ M1 Correctly squares $\sqrt{13}$ and reaches 13π M1 Divides 36π by 3 to get 12π A1 Correct answer from correct working

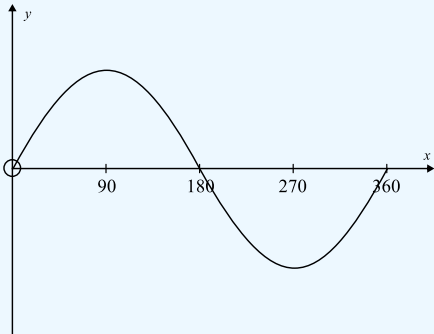
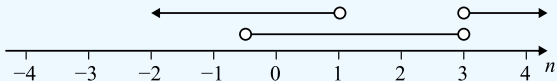
Question	Working	Answer	Notes
Q8a	$p \times p = \frac{49}{100}$ $p = \sqrt{\frac{49}{100}} = \frac{7}{10}$ <p>Monday</p> <p>Work at home</p> <p>Work in office</p> <p>Tuesday</p> <p>Work at home</p> <p>Work in office</p> <p>Work at home</p> <p>Work in office</p>		<p>M1 $p = \sqrt{\frac{49}{100}} = \frac{7}{10}$</p> <p>M1 $P(\text{work in office}) = \frac{3}{10}$</p> <p>A1 Correctly completed tree diagram</p>
Q8b	<p>P(office, home): $\frac{3}{10} \times \frac{7}{10} = \frac{21}{100}$</p> <p>P(home, office): $\frac{7}{10} \times \frac{3}{10} = \frac{21}{100}$</p> $\frac{21}{100} + \frac{21}{100} = \frac{42}{100}$	$\frac{42}{100}$ oe	<p>M1 for a correct probability for one day (e.g. “$\frac{3}{10}$” × “$\frac{7}{10}$” or “$\frac{7}{10}$” “$\frac{3}{10}$”)</p> <p>ft their value for p in pt (a)</p> <p>M1 ft their “$\frac{21}{100}$” × 2</p> <p>A1 cao</p>

Question	Working	Answer	Notes														
Q9a	$\frac{5^5 \times 5^{-2}}{5} = \frac{5^3}{5} = 5^2 = 25$	25	M1 Numerator simplified to 5^3 A1 cao														
Q9b		$\frac{1}{8}$															
Q10	$x^2 - 3x + 10 = 0$ $(x - 5)(x + 2) = 0$ $x = 5$ or $x = -2$	$x = 5$ or $x = -2$	M1 Makes = 0 M1 Factorises correctly A1 both solutions correct														
Q11a	<table border="1"><tr><td>Area of cross-section</td><td>1</td><td>2</td><td>3</td><td>6</td><td>12</td><td>18</td></tr><tr><td>Length</td><td>18</td><td>9</td><td>6</td><td>3</td><td>1.5</td><td>1</td></tr></table>	Area of cross-section	1	2	3	6	12	18	Length	18	9	6	3	1.5	1		B2 All correct (B1 At least 3 correct)
Area of cross-section	1	2	3	6	12	18											
Length	18	9	6	3	1.5	1											
Q11b		18cm^3															
Q11c	Length = 2, so area of cross-section = 9 Side length, x = 3cm Surface area = $2 \times 9 + 4 \times 3 \times 2$ = 42cm^2	42cm^2	B1 Area of cross-section = 9 M1 x = 3cm M1 Surface area = $2 \times 9 + 4 \times 3 \times 2$ A1 cao														
Q12	$\frac{14}{25} = \frac{56}{100} = 56\%$	No	M1 Sight of $\frac{14}{25}$ oe M1 56% correctly calculated A1 Correct conclusion from correct working														

Question	Working	Answer	Notes
Q13a		<p>Frequency densities: 3, 3.2, 4.2, 5, 2.5</p>	<p>M1 At least 4 correct frequency densities M1 Appropriate scale on axes A1 Correct histogram</p>
Q13b	$5 \times 4.2 + 5 \times 5 = 46$	$\frac{46}{194}$	<p>M1 5×4.2 seen or implied A1 $\frac{46}{194}$ oe</p>
Q14	$0.688... - 0.122... = 0.566...$ $x = 0.566...$ $10x = 5.666... \text{ or } 100x = 56.666... \text{ oe}$ $9x = 5.1 \text{ or } 90x = 51 \text{ oe}$ $x = \frac{51}{90} = \frac{17}{30}$	$\frac{17}{30}$	<p>M1 $0.688... - 0.122... = 0.566...$ M1 Multiplies 0.56666666 by power of 10 M1 Reaches $\frac{51}{90}$ A1 Correct simplified fraction</p>
Q15	$y = kx^2$ $36 = k \times 100$ $k = 0.36$ $y = 0.36 \times 3^2 = 0.36 \times 9 = 3.24$	3.24	<p>M1 $36 = k \times 100$ M1 $y = 0.36 \times x^2$ seen or implied A1 cao</p>

Question	Working	Answer	Notes
Q16a	 $\text{Gradient} = \frac{1 - 3}{2 - 1} = -2$	-2	<p>M1 Tangent drawn</p> <p>M1 Calculates gradient of their tangent</p> <p>A1 Answer in range -2.3 to -1.7</p>
Q16b		The gradient represents the speed in m/s at the time $t = 1$	<p>B1 The speed</p> <p>B1 Any of 'in m/s', 'at the time $t = 1$' or 'when the distance is 3' oe</p>
Q17	$r = \frac{7(2p+1)}{5p-3}$ $r(5p-3) = 7(2p+1)$ $5pr - 3r = 14p + 7$ $5pr - 14p = 7 + 3r$ $p(5r - 14) = 7 + 3r$ $p = \frac{7+3r}{5r-14}$	$p = \frac{7+3r}{5r-14}$	<p>M1 Multiplies by $5p - 3$</p> <p>M1 Expands and attempts to move p terms to one side</p> <p>M1 Factorises</p> <p>A1 $p = \frac{7+3r}{5r-14}$ oe</p>

Question	Working	Answer	Notes
Q18	$5x + 10y = 210$ $x = 5y$ $25y + 10y = 210$ $35y = 210$ $y = 6$ $x = y \times 6 = 30$	30 5p coins 6 10p coins	M1 Attempts 2 equations A1 2 correct equations M1 Attempts to solve equations A1 cao
Q19	$r = 2\sqrt{3}$ $12\sqrt{3} \times 2\sqrt{3}$	72	
Q20	 <p>Angle $OAC = \text{angle } OCA = x$ Angle $OAB = \text{angle } OBA = y$ Angle $BAC = x + y$ Angle $AOC = 180 - 2x$ Angle $AOB = 180 - 2y$ Angle $BOC = 360 - (180 - 2x) - (180 - 2y)$ $= 2x + 2y$ $= 2 \times \text{angle } BAC$</p>		M1 Splits into 2 isosceles triangles and identifies that Angle $OAC = \text{angle } OCA$ and Angle $OAB = \text{angle } OBA$ M1 Finds expressions for AOB and AOC M1 Finds expression for BOC A1 Correctly compares to BAC . Must follow fully correct working


Question	Working	Answer	Notes
Q21a			<p>M1 Shape correct</p> <p>A1 All points of intersection with axes correct and -1 and 1 labelled</p>
Q21b		$\sin(x) = \tan(x)$ for 3 values of x	
Q22a	$h^{-1}(x) = x - 3$ $h^{-1}(7) = 7 - 3 = 4$	4	
Q22b	$f(x) < g(x)$ $x^2 - 3 < 5x - x^2$ $2x^2 - 5x - 3 < 0$ $(2x + 1)(x - 3) < 0$ $-\frac{1}{2} < x < 3$ $g(x) < h(x)$ $5x - x^2 < x + 3$ $x^2 - 4x + 3 > 0$ $(x - 3)(x - 1) > 0$ $x < 1$ or $x > 3$ 	$-\frac{1}{2} < x < 1$	<p>M1 Attempts to solve $f(x) < g(x)$, rearranges to get $2x^2 - 5x - 3 < 0$</p> <p>M1 Valid method to solve $2x^2 - 5x - 3 < 0$ e.g. factorising to $(2x + 1)(x - 3)$ or correct substitution into quadratic formula. Don't be concerned with incorrect inequality signs or = signs at this point</p> <p>M1 Valid method to solve $x^2 - 4x + 3 > 0$ e.g. $(x - 3)(x - 1)$ or correct substitution into quadratic formula. Don't be concerned with incorrect inequality signs or = signs at this point</p> <p>M1 $-\frac{1}{2} < x < 3$ or $x < 1$, $x > 3$ seen</p> <p>A1 cao</p>

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