



THIRD SPACE
LEARNING

Mathematics

Paper 2

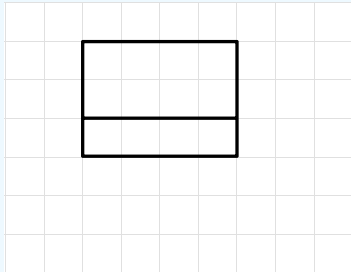
(Calculator)

Higher Tier

Mark Scheme

AQA GCSE

SET 1A

Question	Working	Answer	Notes
Q1		$66\frac{2}{3}\%$	B1
Q2		$\frac{5x-4}{3}$	B1
Q3		160%	B1
Q4		8:343	B1
Q5		$x^2 + y^2 = 25$	B1
Q6	$\frac{7}{4} \times \frac{11}{5} = \frac{77}{20} = 3\frac{17}{20}$		M1 Attempting to convert fractions to mixed numbers A1 shows $\frac{77}{20}$ or equivalent improper fraction
Q7	201-180=21 $\frac{21}{180} \times 100 = 11.6666\dots$	11.7%	M1 £21 seen M1 $\frac{21}{180} \times 100 =$ A1 11.6666.. Or 11.7
Q8		$-3 < x \leq 4$	M1 Identifying -3 and 4 A1 Correct answer
Q9		$\frac{1}{2}n^2 + \frac{1}{2}n$	M1 shows method of finding 2nd difference M1 Shows $\frac{1}{2}n^2$ A1 correct answer oe
Q10			M1 for 4 by 3 rectangle A1 for line through rectangle in correct position

Question	Working	Answer	Notes																								
Q11	<table><tr><th>Weight (g)</th><th>Number of parcels</th><th>Midpoint</th><th>Mp x freq</th></tr><tr><td>$0 < w \leq 10$</td><td>15</td><td>5</td><td>75</td></tr><tr><td>$10 < w \leq 20$</td><td>28</td><td>15</td><td>420</td></tr><tr><td>$20 < w \leq 30$</td><td>14</td><td>25</td><td>350</td></tr><tr><td>$30 < w \leq 40$</td><td>7</td><td>35</td><td>245</td></tr><tr><td></td><td>64</td><td></td><td>1090</td></tr></table> $1090 \div 64 = 17.03125$	Weight (g)	Number of parcels	Midpoint	Mp x freq	$0 < w \leq 10$	15	5	75	$10 < w \leq 20$	28	15	420	$20 < w \leq 30$	14	25	350	$30 < w \leq 40$	7	35	245		64		1090	17.03	M1 Midpoint multiplied by frequency seen M1 correct total of 1090 M1 $1090 \div 64$ A1 Answer which rounds to 17.03
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Q12a	$3(x + 4) = 5x - 6$ $3x + 12 = 5x - 6$ $2x = 18$	$x = 9$	M1 for expanding bracket and attempt to isolate x A1 cao																								
Q12b	$x^2 - 5x + 3x - 15$	$x^2 - 2x - 15$	M1 At least two correct of x^2 , $-5x$, $3x$, -15 A1 cao																								
Q13	$BC^2 = 7^2 + 5^2$ $BC = \sqrt{74}$ $BC = 8.602325267$	8.6cm	M1 7 and 5 substituted in to Pythagoras' Theorem A1 cao																								
Q14	$\pounds 480 = 80\%$ $\pounds 60 = 10\%$ $\pounds 600 = 100\%$	$\pounds 600$	M1 $\pounds 480 = 80\%$ seen A1 cao																								
Q15a		20 times is not enough trials	B1																								
Q15b		<table><tr><td>Side</td><td>Head</td><td>Tail</td></tr><tr><td>Probability</td><td>0.48</td><td>0.52</td></tr></table>	Side	Head	Tail	Probability	0.48	0.52	M1 Total number of heads = $16 + 32 = 48$ M1 Total number of tails = $4 + 48 = 52$ A1 $P(\text{heads}) = \frac{48}{100}$ or equivalent A1 $P(\text{tails}) = \frac{52}{100}$ or equivalent																		
Side	Head	Tail																									
Probability	0.48	0.52																									

Question	Working	Answer	Notes
Q15c	$0.52 \times 300 = 156$	156	M1 0.52×300 oe A1 cao
Q16	<p>Remaining volume =</p> $120 \times 500 \times 700 + \frac{500 \times 140}{2} \times 500$ $= 59\,500\,000 \text{ cm}^3$ <p>Remaining time =</p> $59\,500\,000 \div 466\,666.6... = 127.5 \text{ minutes}$	127.5	<p>M1 Volume of decrease = $14\,000\,000 \text{ cm}^3$ or equivalent</p> <p>M1 Flow rate = $466\,666.6... \text{ cm}^3$ per min or equivalent</p> <p>M1 Remaining volume =</p> $120 \times 500 \times 700 + \frac{500 \times 140}{2} \times 500$ <p>A1 $59\,500\,000 \text{ cm}^3$</p> <p>A1 Remaining time =</p> $59\,500\,000 \div 466\,666.6... = 127.5 \text{ minutes}$
Q17	$360^\circ - 200^\circ = 160^\circ$ $200^\circ - 160^\circ = 40^\circ$ So 40° represents 80 votes $360^\circ \div 40^\circ = 9$ $9 \times 80 = 720$ votes	720	<p>M1 $360^\circ - 200^\circ = 160^\circ$ or Evidence that 40° represents 80 votes</p> <p>M1 $360^\circ \div 40^\circ = 9$</p> <p>A1 720</p>
Q18a	$\frac{8.1 + 3 \times 2.6^3}{4.8} = \frac{60.828}{4.8}$	12.6725	<p>M1 60.828 seen</p> <p>A1 Correct answer</p>
Q18b		12.7	B1 cao
Q19a	$\frac{1}{2}(x+2)(x+4) = 24$ $x^2 + 6x + 8 = 48$ $x^2 + 6x - 40 = 0$		<p>M1 $\frac{1}{2}(x+2)(x+4)$ oe</p> <p>A1 Appropriate steps for proof</p>

Question	Working	Answer	Notes
Q19b	$(x + 10)(x - 4) = 0$ $x = -10$ (invalid) or $x = 4$ $x + 2 = 6, x + 4 = 8, x + 6 = 10$ $6 + 8 + 10 = 24$	24cm	M1 Attempting to factorise and solve A1 cao
Q20a	$y = 3x - 4$ $y = -\frac{3}{4}x + \frac{10}{4}$	$4y + 3x = 10$ and $y = 2 - \frac{3}{4}x$	M1 Attempting to rearrange at least one equation to find the gradient A1 cao
Q20b	$y = -\frac{1}{5}x + c$ $2 = -\frac{1}{5} \times 1 + c$ $c = 2\frac{1}{5}$	$y = -\frac{1}{5}x + 2\frac{1}{5}$	M1 $y = -\frac{1}{5}x + c$ seen A1 oe
Q21	$\frac{24}{N} = \frac{8}{30}$ $N = \frac{24 \times 30}{8} = 90$	90	M1 $\frac{24}{N} = \frac{8}{30}$ oe A1 cao
Q22	$8(4^n) = 0.125$ $4^{-n} = \frac{1}{64}$ $4^{-n} = 4^{-3}$	3	M1 dividing by 8 M1 recognising $\frac{1}{64}$ as 4^{-3} A1 cao
Q23a	AC:CD = 8:3 = 40:15 AB:BD = 2:3 = 22:33	22:18:15	M1 finding common multiple of 11 and 5 M1 finding correct BC (18/55) A1 cao
Q23b	$\frac{18}{55} \times 2.75$	0.9 m	M1 for process to find correct fraction of 2.75 A1 0.9 m oe

Question	Working	Answer	Notes
Q24	Upper bound for area: 3.85m Lower bound for length: 2.35m Upper bound for width: $\frac{3.85}{2.35} = 1.638\text{m}$	1.638m	M1 Upper bound for area correct M1 Dividing upper bound for area by lower bound for length A1 cao
Q25a	Volume of cylinder: $\pi r^2 \times 0.1$ Volume of hemisphere: $\frac{1}{2} \times \frac{4}{3} \pi r^3$ Total volume: $0.1\pi r^2 + \frac{2}{3}\pi r^3 = \pi r^2(0.1 + \frac{2}{3}r)$		M1 Volume of cylinder and volume of hemisphere correct A1 Correct steps
Q25b	$Area = \frac{800}{2825} = 0.28318584$ $Radius = \sqrt{\frac{0.28318584}{\pi}} = 0.30023$ $Volume = \pi \times 0.30023^2 (0.1 + \frac{2}{3} \times 0.30023)$ $Volume = 0.085\text{m}^3$	0.085m ³	M1 Correctly calculating area M1 Attempting to find the radius M1 Substituting their value for radius into $V = \pi r^2(0.1 + \frac{2}{3}r)$ A1 cao
Q25c	$\frac{1}{3}\pi(\frac{h}{2})^2 h = 0.085$ $\frac{1}{12}\pi h^3 = 0.085$	h = 0.7 m	M1 correct expression for Volume in terms of h, or equivalent just in terms of r M1 process to divide answer from (b) by $\frac{1}{12}\pi$ A1 Answer which rounds to 0.7
Q26a	$x^2 - 10x + 13$ $(x - 5)^2 - 25 + 13$ $(x - 5)^2 - 12$	$(x - 5)^2 - 12$	M1 sight of $(x - 5)^2$ A1 cao
Q26b		(5, -12)	B1

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