



THIRD SPACE
LEARNING

Mathematics

Paper 2

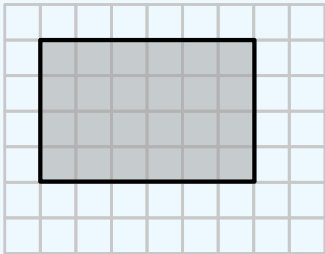
(Calculator)

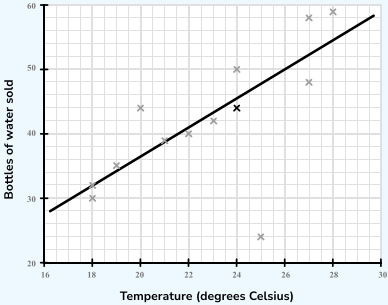
Higher Tier

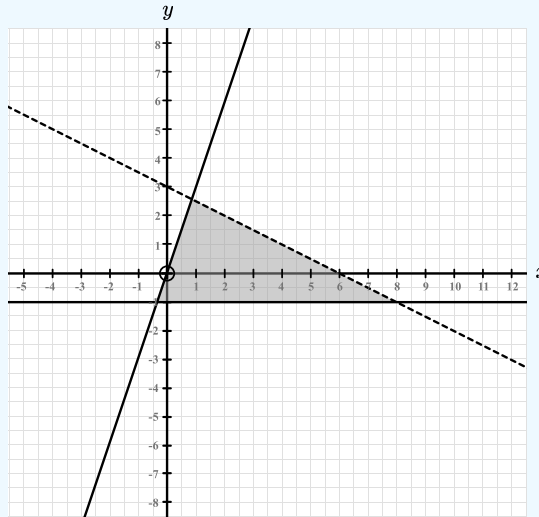
Mark Scheme

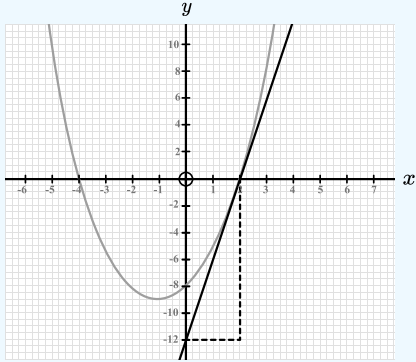
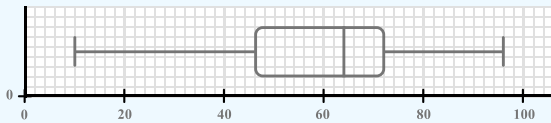
Edexcel GCSE

SET 1B

Question	Working	Answer	Notes
Q1a		$4n - 5$	M1 $4n \pm a$ where a is an integer A1 $4n - 5$
Q1b		No, all the terms are odd	C1 No C1 All terms are odd or other correct explanation
Q2	$7 \times 10 = 70$ $\frac{1}{2} \times 4 \times 10 = 20$ $\frac{1}{2} \times \pi \times 5 = 39.2699\dots$ $70 - 20 + 39.2699\dots = 89.2699\dots$	89.27cm^2	M1 Area of rectangle: 70cm^2 and area of triangles 20cm^2 M1 Area of semi circle $39.2699\dots \text{cm}^2$ or $70 - 20 + 39.2699\dots = 89.2699\dots$ seen A1 Correctly rounded 89.27cm^2
Q3			M1 One side length correct (6 or 4) A1 Rectangle with side lengths 6 and 4
Q4	$0.75 \times 72 = 54$ Yoghurt: $\frac{10}{10} \times 8 = 8\text{g}$ Chicken: $\frac{24}{4} \times 3 = 18\text{g}$ Peanuts: $\frac{26}{10} \times 4 = 10.4\text{g}$ Beans: $23 \times 2 = 46\text{g}$ $8 + 18 + 10.4 + 46 = 82.4\text{g}$	He ate more than his recommended daily intake.	P1 Finding the amount of protein Badar requires by multiplying 0.75 by 72 P1 Correctly finding protein amounts for two of the foods P1 Correctly finding protein amounts for all foods P1 Adding the protein amounts C1 Correct conclusion following correct working

Question	Working	Answer	Notes
Q5a		50	<p>M1 Reasonable line of best fit drawn</p> <p>A1 Answer in range 49 - 51. Must see evidence that this has come from graph</p>
Q5b		24	B1 cao
Q6a	$518 \div 140 = 3.7$ $3.7 \times 100 = 370$	£370	<p>M1 £518 = 140% or dividing by 140 or 1.4</p> <p>A1 £370</p>
Q6b	$28000 \times 1.02^3 = £29173.82$	£29713.82	<p>M1 28000×1.02^3 or</p> <p>$28000 + 560 = £28560$ for first year seen</p> <p>A1 £29713.82</p>
Q6c	$£29173.82 - £28000 = £1173.82$ $£1173.82 \div 12 = £97.82$ extra per month Bill increase: $£518 - £370 = £148$ Yes he is correct	Yes	<p>P1 Finding the amount of protein Badar requires by multiplying 0.75 by 72</p> <p>P1 Correctly finding protein amounts for two of the foods</p> <p>P1 Correctly finding protein amounts for all foods</p> <p>P1 Adding the protein amounts</p> <p>C1 Correct conclusion following correct working</p>

Question	Working	Answer	Notes
Q7			M1 $y \leq 2x$ plotted correctly M1 $x + 2y < 6$ plotted correctly (dotted line) M1 $y \geq -1$ plotted correctly A1 Correct region shaded
Q8	$PR = 11 \times \tan(32) = 6.87356\dots$ $\cos(x) = \frac{6.87356\dots}{21}$ $x = 70.89426\dots$ $x = 70.9^\circ$		M1 $PR = 11 \times \tan(32)$ A1 $PR = 6.87356\dots$ M1 $\cos(x) = \frac{6.87356\dots}{21}$ C1 Correct steps leading to $x = 70.9^\circ$
Q9a	$\frac{14000 - 12500}{12500} \times 100 = 12\%$	12%	M1 Substituting values into $\frac{\text{change}}{\text{original}} \times 100$ A1 12%
Q9b	$14000 \times 0.85^3 = \pounds 8597.75$	£8597.75	M1 14000×0.85^3 or $\pounds 14000 - \pounds 2100 = \pounds 11900$ for first year A1 £8597.75
Q10a		(-1, -9)	B1 cao

Question	Working	Answer	Notes
Q10b		-8	B1 cao
Q10c		$x = -4, x = 2$	B1 $x = -4$ B1 $x = 2$
Q10d		6	M1 tangent to the curve drawn A1 $\frac{12}{2} = 6$
Q11a	At 60 the cumulative frequency is 33 At 40 the cumulative frequency is 16 $33 - 16 = 17$	17	M1 33 and 16 seen A1 $33 - 16 = 17$
Q11b	Median: 64, lower quartile: 46, upper quartile: 72 		M1 At least two of median: 64, lower quartile: 46, upper quartile: 72 seen M1 Highest and lowest values plotted correctly A1 Fully correct box plot
Q12		It should be $1000x$ rather than $100x$ The numerator should be 312 not 315	C1 It should be $1000x$ rather than $100x$ C1 The numerator should be 312 not 315

Question	Working	Answer	Notes
Q13	Maximum load: $18587.5 = 16187.5\text{kg}$ Minimum safety standard: 17500kg	Yes	M1 $17500/18500$ or $175/185$ or $82.5/87.5$ seen M1 $185 \times 87.5 = 16187.5\text{kg}$ C1 Correct conclusion and comparison to 17500kg
Q14a	$\frac{9}{210} = \frac{x}{4200}$ $x = 180$	180	M1 $\frac{9}{210} = \frac{x}{4200}$ or $4200 \times \frac{9}{210}$ oe A1 180
Q14b	$4200 \div 4000 = 1.05$		C1 $4200 \div 4000 = 1.05$
Q14c	$f_0 = 4200$ $f_1 = 1.05 \times 4200 = 4410$ $f_2 = 1.05 \times 4410 = 4631$ $f_3 = 1.05 \times 4631 = 4862$		M1 $f_1 = 1.05 \times 4200 = 4410$ A1 4862 or 4863
Q14d		The number of fish will continue to increase at the same rate	C1 A reasonable statement
Q15	$337.5 \div 150 = \frac{9}{4}$ $\sqrt{\frac{9}{4}} = \frac{27}{8}$ $140 \times \frac{27}{8} = 472.5\text{cm}^3$		M1 $337.5 \div 150 = \frac{9}{4}$ M1 $\sqrt{\frac{9}{4}} = \frac{27}{8}$ C1 $140 \times \frac{27}{8} = 472.5\text{cm}^3$

Question	Working	Answer	Notes
Q16a	$y = 3x + 7$ $\frac{y-7}{3} = x$ $f^{-1}(x) = \frac{x-7}{3}$	$f^{-1}(x) = \frac{x-7}{3}$	M1 Subtracting 7 and dividing by 3 A1 Answer given with correct notation
Q16b	$g(2) = 2^2 - 5 \times 2 = -6$ $g(-6) = (-6)^2 - 5 \times (-6) = 66$	66	M1 $g(2) = -6$ or $gg(x) = (x^2 - 5x)^2 - 5(x^2 - 5x)$ A1 66
Q16c	$fg(x) = 3(x^2 - 5x) + 7$ $3x^2 - 15x + 7 = -5$ $3x^2 - 15x + 12 = 0$ $x^2 - 5x + 4 = 0$ $(x - 1)(x - 4) = 0$ $x = 1$ or $x = 4$	$x = 1$ or $x = 4$	M1 $fg(x) = 3(x^2 - 5x) + 7$ M1 Reaching $3x^2 - 15x + 12 = 0$ M1 $(x - 1)(x - 4) = 0$ oe A1 $x = 1$ or $x = 4$
Q17	$AC^2 = 9^2 + 8^2$ $AC = \sqrt{145}$ $OC = \frac{\sqrt{145}}{2}$ $OE = \frac{\sqrt{145}}{2} \times \tan(70)$ $OE = 16.54\text{cm}$	16.54cm	M1 $OC = \frac{\sqrt{145}}{2}$ M1 $OE = \frac{\sqrt{145}}{2} \times \tan(70)$ A1 $OE = 16.54\text{cm}$

Question	Working	Answer	Notes
Q18a	$(-6)^2 + (4)^2 = 52$	$x^2 + y^2 = 52$	M1 $x^2 + y^2 = a$ A1 $x^2 + y^2 = 52$
Q18b	Gradient of normal: $-\frac{2}{3}$ Gradient of tangent: $\frac{3}{2}$ $y = \frac{3}{2}x + c$ $4 = \frac{3}{2}(-6) + c$ $c = 4 + 9 = 13$ $y = \frac{3}{2}x + 13$		M1 Gradient of normal: $-\frac{2}{3}$ M1 Gradient of tangent: $\frac{3}{2}$ M1 $y = \frac{3}{2}x + c$ C1 correct steps to $y = \frac{3}{2}x + 13$
Q18c	Lower limit: line passes through (6, -4) $y = \frac{3}{2}x + c$ $-4 = \frac{3}{2}(6) + c$ $c = -4 - 9 = -13$	$-13 < c < 13$	A1 -13 A1 $-13 < c < 13$

Help ease the pressure with a personalised revision programme for each of your target KS4 students

Our one to one GCSE revision programme is designed to help your target students reach their potential in their GCSE maths exams.

Our specialist maths tutors work one to one with each student, focusing on securing core KS4 content and building familiarity with the kinds of questions they'll be tackling in their GCSE exams.

Get in touch today:

✉ hello@thirdspacelearning.com

🔍 thirdspacelearning.com

☎ 0203 771 0095