



THIRD SPACE
LEARNING

Mathematics

Paper 2

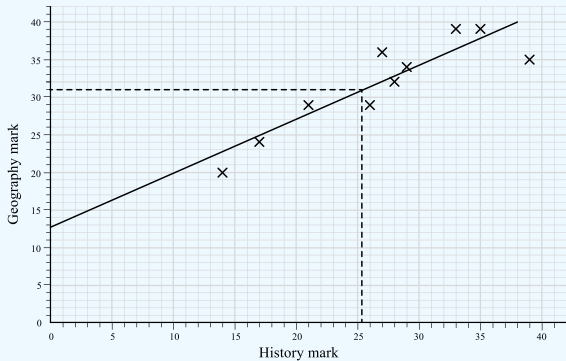
(Calculator)

Higher Tier

Mark Scheme

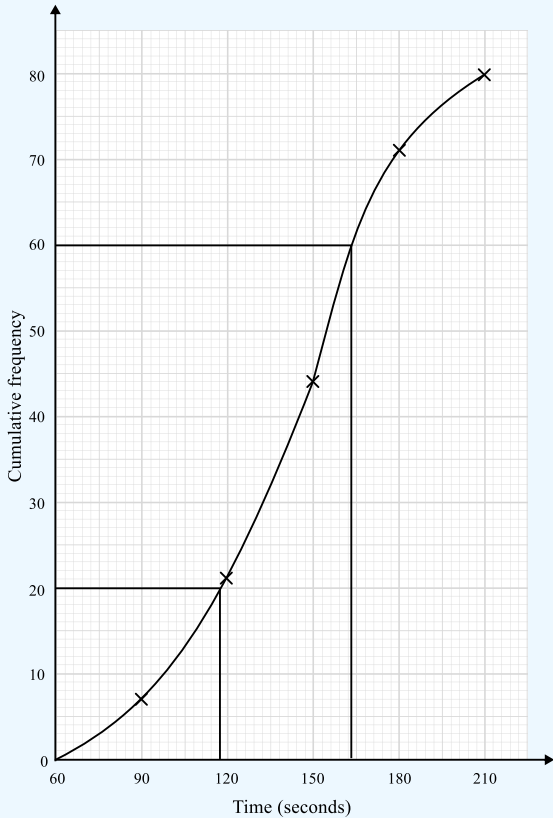
AQA GCSE

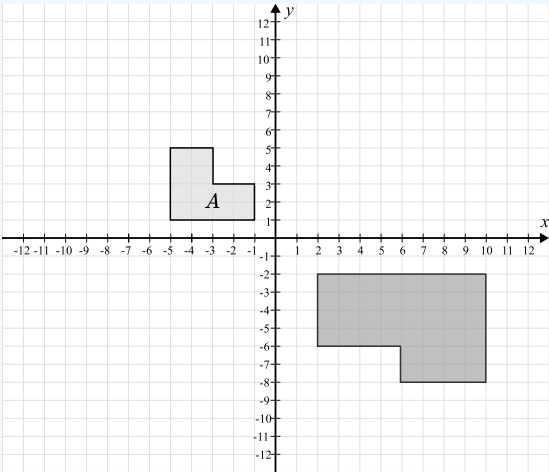
SET 5

Question	Working	Answer	Notes
Q1	$\tan(x) = \frac{6}{11}$ $x = \tan^{-1}\left(\frac{6}{11}\right)$ $x = 28.61045967$	$x = 28.6^\circ$	M1 $\tan(x) = \frac{6}{11}$ or $x = \tan^{-1}\left(\frac{6}{11}\right)$ A1 Correct answer, rounded to 3sf
Q2a	$\frac{1}{0.4} = 2.5$	2.5	
Q2b		$5.25 \leq x < 5.35$	
Q3a		Positive correlation	
Q3b		31	M1 For method to read off (e.g. line of best fit or a line up from 25) A1 for an answer in the range 26 - 36
Q3c		Geography seems easier as the marks are generally higher	B1 'Geography seems easier' B1 'Because the marks are generally higher' oe
Q4	Co-interior angle = $180 - 121 = 59$ Bearing = $360 - 59 = 301^\circ$	301°	M1 Correct sketch with bearing labelled or correct first step A1 cao

Question	Working	Answer	Notes
Q5	Try different values: $7000 \times 1.06^4 = 8837.34$ $7000 \times 1.06^5 = 9367.58$ $7000 \times 1.06^6 = 9929.63$	$n = 5$	M1 Tries at least 1 value for n A1 cao
Q6	$A \text{ to } B = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$ $B \text{ to } C = \begin{pmatrix} 10 \\ 15 \end{pmatrix}$ $C = (16, 24)$	$(16, 24)$	M1 A to B 4 along and 6 up stated M1 Divides by 2 and multiplies by 5 to find BC or by 7 to find AC M1 ft Adds their BC onto B or their AC onto A A1 cao
Q7	$13.7^2 = 187.69$ $\sqrt{188} = 13.7113092$ $\sqrt{189} = 13.74772708$ $\sqrt{190} = 13.78404875$	189	M1 Squares 13.7 A1 cao
Q8	Scale factor: $18 \div 12 = 1.5$ $1.5(2x + 10) = 5x + 9$ $3x + 15 = 5x + 9$ $15 = 2x + 9$ $6 = 2x$ $x = 3$ Perimeter = $5 \times 3 + 9 + 3 \times 3 + 4 + 18$ $= 24 + 13 + 18$ $= 55\text{cm}$	55cm	B1 Scale factor: $18 \div 12 (= 1.5)$ M1 "Their 1.5" $\times (2x + 10) = 5x + 9$ A1 $x = 3$ M1 (dep at least M1 previously awarded) Substitutes their " x " to find perimeter A1 cao

Question	Working	Answer	Notes												
Q9a	<table><tr><th>Time, t seconds</th><th>Cumulative frequency</th></tr><tr><td>$60 \leq t < 90$</td><td>7</td></tr><tr><td>$60 \leq t < 120$</td><td>21</td></tr><tr><td>$60 \leq t < 150$</td><td>44</td></tr><tr><td>$60 \leq t < 180$</td><td>71</td></tr><tr><td>$60 \leq t < 210$</td><td>80</td></tr></table>	Time, t seconds	Cumulative frequency	$60 \leq t < 90$	7	$60 \leq t < 120$	21	$60 \leq t < 150$	44	$60 \leq t < 180$	71	$60 \leq t < 210$	80		
Time, t seconds	Cumulative frequency														
$60 \leq t < 90$	7														
$60 \leq t < 120$	21														
$60 \leq t < 150$	44														
$60 \leq t < 180$	71														
$60 \leq t < 210$	80														
Q9b			M1 All points correctly plotted A1 Joined with a smooth curve												

Question	Working	Answer	Notes
Q9c	 <p>Lower Quartile = 117 Upper Quartile = 164 Interquartile range = $164 - 117$</p>	$164 - 117 = 47$	<p>M1 Lower quartile between 114 and 120 Upper quartile between 161 and 167 or ft their graph A1 Answer in the range 41 to 53 or ft their graph</p>
Q10a	$10 = 0.25$ $40 = 1$	40	<p>M1 $10 = \frac{1}{4}$ of cards A1 cao</p>

Question	Working	Answer	Notes
Q10b	Diamond: $\frac{13}{40} = 0.325$ Spade: $1 - 0.325 - 0.275 - 0.25 = 0.15$	0.325, 0.15	B1 Diamond correct B1 Spade correct
Q10c	$\frac{13}{25} = 0.25$	Yes, because in a full pack of cards the probability would be 0.25 and $0.275 > 0.25$	M1 0.25 oe seen A1 Correct comparison and conclusion
Q11	$L_2: y = -\frac{1}{3}x + \frac{1}{3}$ $m_1 \times m_2 : 3 \times -\frac{1}{3} = -1$	Their gradients multiply to make -1 , therefore perpendicular	M1 Gradient $L_1 = -\frac{1}{3}$ A1 Correct conclusion
Q12	$360 \div 1.16 = \text{£}310.34(\dots)$ $385 \div 1.37 = \text{£}281.02(\dots)$	London	M1 Converts € to £ M1 Convert \$ to £ A1 Correct conclusion from correct working
Q13			M1 Enlargement scale factor 2 A1 cao

Question	Working	Answer	Notes
Q14a	$3\{2x + 5[4x - 7(x - 2)] - 6\}$ $= 3\{2x + 5[4x - 7x + 14] - 6\}$ $= 3\{2x - 15x + 70 - 6\}$ $= 3\{-13x + 64\}$ $= -39x - 192$	$-39x - 192$	M1 ft Correctly expands any one set of brackets A1 cao
Q14b	$5x^2 + 2x - 3 = 5x^2 + 5x - 3x - 3$ $= 5x(x + 1) - 3(x + 1)$ $= (5x - 3)(x + 1)$	$(5x - 3)(x + 1)$	M1 $(5x + a)(x + b)$ or $(ax - 3)(bx + 1)$ A1 cao
Q15	$\pi \times (1.12r)^2 = 1.2544\pi r^2$ % increase is 25.44%	25.44%	M1 $\pi \times (1.12r)^2$ M1 $1.2544\pi r^2$ A1 cao
Q16a	$2^3 - 2 \times 2^2 - 1 = -1$ $3^3 - 2 \times 3^2 - 1 = 8$	Change of sign shows root	M1 Substitutes 2 and 3 into $x^3 - 2x^2 - 1$ A1 Correct conclusion
Q16b	$x^3 - 2x^2 - 1 = 0$ $x^3 = 2x^2 + 1$ $x = \sqrt[3]{2x^2 + 1}$		B1 Fully correct with at least 2 steps

Question	Working	Answer	Notes
Q16c	$x_1 = \sqrt[3]{2 \times 2.5^2 + 1} = 2.3811$ $x_2 = 2.3108$ $x_3 = 2.2689$ $x_4 = 2.2437$		M1 Attempts to substitute 2.5 into $x_{n+1} = \sqrt[3]{2x_n^2 + 1}$ A1 $x_1 = \sqrt[3]{2 \times 2.5^2 + 1} = 2.3811(\dots)$ A1 All values correct to 4 decimal places
Q17a	$a^2 = 8.1^2 + 11.3^2 - 28.1 \times 11.3 \cos(72)$ $a^2 = 136.731349$ $a = 11.69321808$	11.7cm	M1 Correct substitution into cosine rule M1 $a^2 = 136.731349$ A1 cao
Q17b	$A = \frac{1}{2} \times 8.1 \times 11.3 \sin(72)$ $A = 43.52510147$	43.5cm ²	M1 Correct substitution into area formula A1 cao
Q18	$\vec{DE} = -\mathbf{a} - 3\mathbf{b} + 3\mathbf{a} + 4\mathbf{b}$ $\vec{DE} = 2\mathbf{a} + \mathbf{b}$ $\vec{DC} = \frac{9}{4} (2\mathbf{a} + \mathbf{b})$ $\vec{DC} = \frac{9}{2} \mathbf{a} + \frac{9}{4} \mathbf{b}$ $\vec{AC} = \mathbf{a} + 3\mathbf{b} + \frac{9}{2} \mathbf{a} + \frac{9}{4} \mathbf{b}$ $\vec{AC} = \frac{11}{2} \mathbf{a} + \frac{21}{4} \mathbf{b}$		M1 Correct expression for DE M1 Uses ratio to get correct expression for DE or DC M1 Adds vectors using a correct pathway A1 cao


Question	Working	Answer	Notes
Q19a	$-2x^2 + 12x + 11 = -2[x^2 - 6x] + 11$ $= -2[(x - 3)^2 - 9] + 11$ $= -2(x - 3)^2 + 29$	$29 - 2(x - 3)^2$	M1 Factorises out -2 M1 Completes square A1 cao
Q19b		$(3, 29)$	
Q20	$\frac{1 + \sqrt{9a}}{b - \sqrt{4a}} \times \frac{b + \sqrt{4a}}{b + \sqrt{4a}}$ $= \frac{b + 2\sqrt{a} + 3b\sqrt{a} + 6a}{b^2 - 4a}$ $= \frac{b + 6a + (2 + 3b)\sqrt{a}}{b^2 - 4a}$	$m = b + 6a$ $n = 2 + 3b$ $p = b^2 - 4a$	M1 Attempts to multiply by $\frac{b + \sqrt{4a}}{b + \sqrt{4a}}$ M1 Correctly multiplies (may not be simplified) A1 Reaches $\frac{b + 2\sqrt{a} + 3b\sqrt{a} + 6a}{b^2 - 4a}$ M1 Groups terms A1 cao
Q21	$x^2 + (2x - 5)^2 = 25$ $x^2 + 4x^2 - 20x + 25 = 25$ $5x^2 - 20x = 0$ $5x(x - 4) = 0$ $x = 0 \text{ or } x = 4$ $y = -5 \text{ or } y = 3$ $(0, -5) \text{ and } (4, 3)$ Length: $\sqrt{4^2 + 8^2} = \sqrt{80} = 4\sqrt{5}$	$4\sqrt{5}$	M1 Substitutes and attempts to solve M1 Reaches $5x^2 - 20x = 0$ M1 Solves for x M1 Finds values for y M1 Use of Pythagoras theorem A1 cao

Looking to improve your school's maths results without stretching your budget?

Tutoring from our spoken AI maths tutor Skye gives schools an even more affordable option for every pupil.

- ✓ 90% cheaper than other tutoring providers
- ✓ Curriculum-aligned lessons designed by qualified teachers
- ✓ Discounts available for long-term bookings and MATs

 thirdspacelearning.com

 0203 771 0095

 hello@thirdspacelearning.com

Where to go next?

For more GCSE maths revision resources and worksheets, visit the Third Space Learning [GCSE maths revision](#) pages. Or scan the QR code to discover our library of FREE GCSE maths revision resources:

