



THIRD SPACE
LEARNING

Mathematics

Paper 1

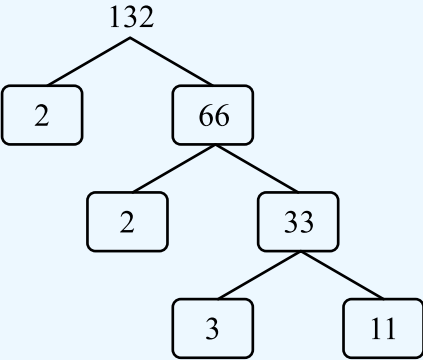
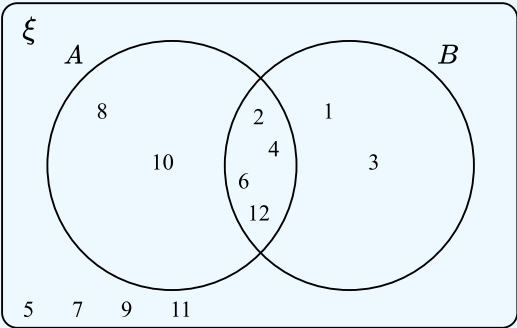
(Non-Calculator)

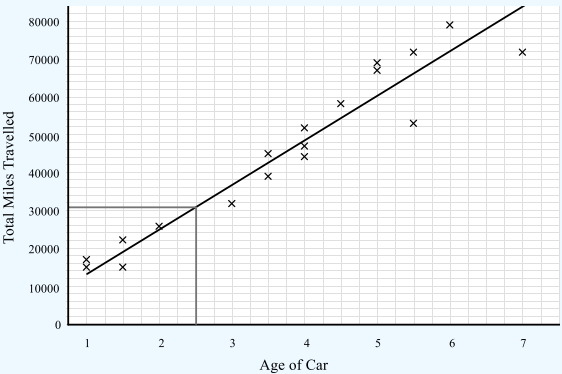
Higher Tier

Mark Scheme

Edexcel GCSE

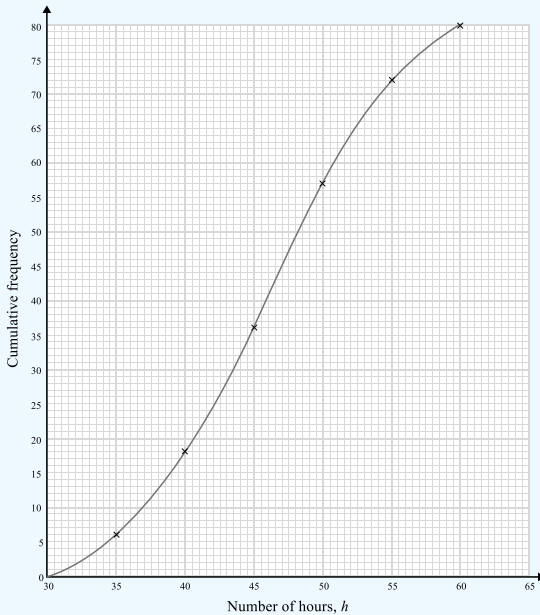
SET 4

Question	Working	Answer	Notes
Q1		$2^2 \times 3 \times 11$	M1 Correctly identifies at least 2 prime factors A1 (accept $2 \times 2 \times 3 \times 11$)
Q2	$5\frac{1}{3} - 2\frac{1}{2} = \frac{16}{3} - \frac{5}{2}$ $= \frac{32}{6} - \frac{15}{6}$ $= \frac{17}{6} = 2\frac{5}{6}$	$2\frac{5}{6}$	M1 $5\frac{1}{3} - 2\frac{1}{2}$ M1 Converts to improper fractions M1 Use of common denominator and subtracts numerators A1 cao
Q3a			M1 At least 4 items placed correctly M1 At least 8 items placed correctly A1 All correct
Q3b	Number of values in $A \cup B = 8$	$\frac{8}{12}$	M1 8 elements in $A \cup B$ A1 $\frac{8}{12}$ oe

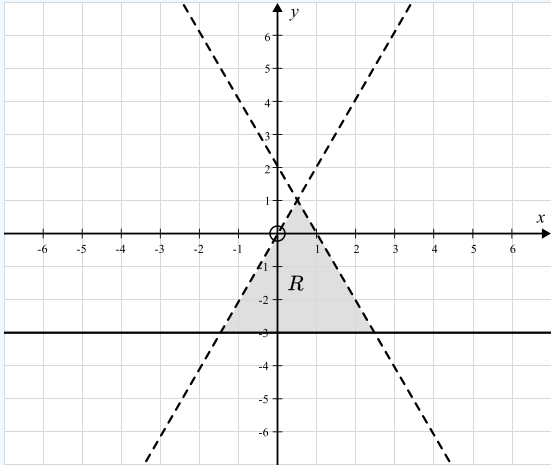
Question	Working	Answer	Notes
Q4a		As the age of the car increases, the total distance travelled increases	B1 Correct description
Q4b		31000 <i>miles</i>	M1 Reasonable line of best fit A1 [29000 – 33000] <i>miles</i>
Q5a	$p - 3 < \frac{p + 6}{3}$ $3p - 9 < p + 6$ $2p < 15$ $p < 7.5$	$p < 7.5$	M1 Reaches $3p - 9 < p + 6$ M1 Isolates term in p A1 cao
Q5b		$(x + 8)(x - 5)$	M1 $(x \pm 8)(x \pm 5)$ A1 cao
Q5c		$x = -8$ or $x = 5$	A1 -8 and 5 seen
Q6a	$3x + 20 + 2x + 10 = 180$ $5x + 30 = 180$ $5x = 150$ $x = 30$	$x = 30$	M1 Forms equation $3x + 20 + 2x + 10 = 180$ or $5x + 30 = 180$ seen M1 Isolates term/terms in x A1 cao

© Third Space Learning 2025. You may photocopy this page.

Question	Working	Answer	Notes														
Q10a	$25^{\frac{1}{2}} = \frac{1}{\sqrt{25}} = \frac{1}{5}$	$\frac{1}{5}$	M1 $\sqrt{25}$ or $\frac{1}{25^k}$ seen A1 cao														
Q10b	$16^{\frac{3}{2}} = \sqrt{16}^3 = 4^3 = 64$ $27^{\frac{5}{3}} = \sqrt[3]{27}^5 = 3^5 = 243$ $64 + 243 = 307$	307	M1 $16^{\frac{3}{2}} = \sqrt{16}^3 = 4^3 = 64$ M1 $27^{\frac{5}{3}} = \sqrt[3]{27}^5 = 3^5 = 243$ A1 cao														
Q10c	$25^{n+2} = (5^2)^{n+2} = 5^{2n+4}$ $5^n \times 5^{2n+4} = 5^{3n+4}$	5^{3n+4}	M1 Rewrites 25 as 5^2 A1 cao														
Q11a	<table><tr><th>Number of hours (h)</th><th>Cumulative frequency</th></tr><tr><td>$30 < h \leq 35$</td><td>6</td></tr><tr><td>$30 < h \leq 40$</td><td>18</td></tr><tr><td>$30 < h \leq 45$</td><td>36</td></tr><tr><td>$30 < h \leq 50$</td><td>57</td></tr><tr><td>$30 < h \leq 55$</td><td>72</td></tr><tr><td>$30 < h \leq 60$</td><td>80</td></tr></table>	Number of hours (h)	Cumulative frequency	$30 < h \leq 35$	6	$30 < h \leq 40$	18	$30 < h \leq 45$	36	$30 < h \leq 50$	57	$30 < h \leq 55$	72	$30 < h \leq 60$	80		A1 Fully correct cumulative frequency table
Number of hours (h)	Cumulative frequency																
$30 < h \leq 35$	6																
$30 < h \leq 40$	18																
$30 < h \leq 45$	36																
$30 < h \leq 50$	57																
$30 < h \leq 55$	72																
$30 < h \leq 60$	80																

Question	Working	Answer	Notes										
Q11b			<p>M1 Points plotted at $(a, 6)$, $(b, 18)$, $(c, 36)$, $(d, 57)$, $(e, 72)$ and $(f, 80)$</p> <p>A1 All points correct using cumulative frequency and class width endpoints</p>										
Q11c	<p>75% of 80 = 60</p> <p>Line across at 60</p>	Yes	<p>M1 Line across at 60 (or line up at 51)</p> <p>M1 Reads off 51 (or 59)</p> <p>A1 Correct conclusion based on correct working</p>										
Q12	<table border="1" data-bbox="284 1203 842 1273"><tr><td>x</td><td>120</td><td>60</td><td>24</td><td>3</td></tr><tr><td>y</td><td>1</td><td>2</td><td>5</td><td>40</td></tr></table>	x	120	60	24	3	y	1	2	5	40		<p>A1 1 value correct</p> <p>A1 2 values correct</p> <p>A1 3 values correct</p>
x	120	60	24	3									
y	1	2	5	40									

Question	Working	Answer	Notes
Q13	$x = 0.083333\dots$ $100x = 8.3333\dots$ $1000x = 83.3333\dots$ $900x = 75$ $x = \frac{75}{900} = \frac{1}{12}$ $y = 0.4444\dots$ $10y = 4.4444\dots$ $9y = 4$ $y = \frac{4}{9}$ $\frac{1}{12} \times \frac{4}{9} = \frac{4}{108} = \frac{1}{27}$		<p>M1 $0.\dot{4}\dots = \frac{4}{9}$ or $0.08\dot{3}\dots = \frac{1}{12}$ seen</p> <p>M1 $\frac{1}{12} \times \frac{4}{9} (= \frac{4}{108})$</p> <p>A1 Simplifies to $\frac{1}{27}$ following correct working</p>
Q14	$\frac{3(x+5)}{12} - \frac{4(x-3)}{12}$ $\frac{3x+15-4x+12}{12}$ $\frac{27-x}{12}$	$\frac{27-x}{12}$	<p>M1 Introduces common denominator</p> <p>M1 Correctly expands numerator</p> <p>A1 cao</p>
Q15	$\vec{BC} = 15\mathbf{a} - 10\mathbf{b}$ $\vec{AC} = 24\mathbf{a} - 16\mathbf{b}$	$24\mathbf{a} - 16\mathbf{b}$	<p>M1 Vector of the form $n(3\mathbf{a} - 2\mathbf{b})$</p> <p>A1 cao</p>

Question	Working	Answer	Notes
Q16			<p>M1 Correctly plots at least 2 lines</p> <p>M1 All three lines correct. Must be dotted/solid as shown</p> <p>A1 Correct shading to indicate region (May shade wanted or unwanted area, as long as region is clear.</p>
Q17	<p>Area of sector: $\frac{30}{360} \times \pi \times r^2 = \frac{1}{12} \pi r^2$</p> <p>Area of triangle: $\frac{1}{2} \times r \times r \times \sin(30)$</p> <p>$= \frac{1}{2} r^2 \times \frac{1}{2} = \frac{1}{4} r^2$</p> <p>$\frac{1}{12} \pi r^2 - \frac{1}{4} r^2 = 3\pi - 9$</p> <p>$(\frac{1}{12} \pi - \frac{3}{12}) r^2 = 3\pi - 9$</p> <p>$r^2 = \frac{3\pi - 9}{\frac{1}{12} \pi - \frac{3}{12}} = \frac{12(3\pi - 9)}{\pi - 3} = \frac{36(\pi - 3)}{\pi - 3} = 36$</p> <p>$r = 6$</p>	<p>$r = 6cm$</p>	<p>M1 Area of sector $\frac{30}{360} \times \pi \times r^2 (= \frac{1}{12} \pi r^2)$</p> <p>M1 Area of triangle</p> <p>$\frac{1}{2} \times r \times r \times \sin(30) (= \frac{1}{4} r^2)$</p> <p>M1 Forms an equation using the area of the segment</p> <p>M1 Attempts to solve the equation and reaches a value for r Or by matching coefficients e.g. $\frac{r^2}{12} = 3$</p> <p>A1 cao</p>

Question	Working	Answer	Notes
Q18a	$g(x) = 2\sqrt{x} + 1$ $y = 2\sqrt{x} + 1$ $y - 1 = 2\sqrt{x}$ $\frac{y-1}{2} = \sqrt{x}$ $\left(\frac{y-1}{2}\right)^2 = x$ $g^{-1}(x) = \left(\frac{x-1}{2}\right)^2$	$g^{-1}(x) = \left(\frac{x-1}{2}\right)^2$	M1 Attempt to rearrange to make 'x' the subject A1 Correct answer, must be in terms of x
Q18b	$2\sqrt{3x+4} + 1 = 9$ $2\sqrt{3x+4} = 8$ $\sqrt{3x+4} = 4$ $3x + 4 = 16$ $3x = 12$ $x = 4$	$x = 4$	M1 $2\sqrt{3x+4} + 1 = 9$ seen M1 Attempts to solve, reaching a value for x A1 cao

Question	Working	Answer	Notes
Q19	$\frac{10 - \sqrt{20}}{3 + \sqrt{5}} \times \frac{3 + \sqrt{5}}{3 - \sqrt{5}}$ $= \frac{30 - 3\sqrt{20} - 10\sqrt{5} + \sqrt{100}}{9 - 5}$ $= \frac{40 - 6\sqrt{5} - 10\sqrt{5}}{4}$ $= \frac{40 - 16\sqrt{5}}{4}$ $= 10 - 4\sqrt{5}$	$10 - 4\sqrt{5}$	<p>M1 $\times \frac{3 - \sqrt{5}}{3 - \sqrt{5}}$</p> <p>M1 Denominator $9 - 5$ seen or implied</p> <p>M1 Numerator $30 - 3\sqrt{20} - 10\sqrt{5} + \sqrt{100}$ seen or implied</p> <p>A1 cao</p>
Q20	$(2x^2 + 6x + x + 3)(x - 4)$ $2x^3 - 8x^2 + 7x^2 - 28x + 3x - 12$ $2x^3 - x^2 - 25x - 12$ $a = 2, b = -1, c = -25, d = -12$ $ad + b = (2 \times -12) + (-1)$ $= -24 - 1 = -25 = c$		<p>M1 $(2x^2 + 7x + 3)(x - 4)$ or $(2x^2 - 7x - 4)(x + 3)$ or $(x^2 - x - 12)(2x + 1)$</p> <p>M1 Correct expansion of 3 brackets</p> <p>M1 $2x^3 - x^2 - 25x - 12$ or $a = 2, b = -1, c = -25$ and $d = -12$ seen</p> <p>A1 Substitution into $ad + b = c$ with correct conclusion</p>

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