



THIRD SPACE
LEARNING

Mathematics

Paper 3

(Calculator)

Higher Tier

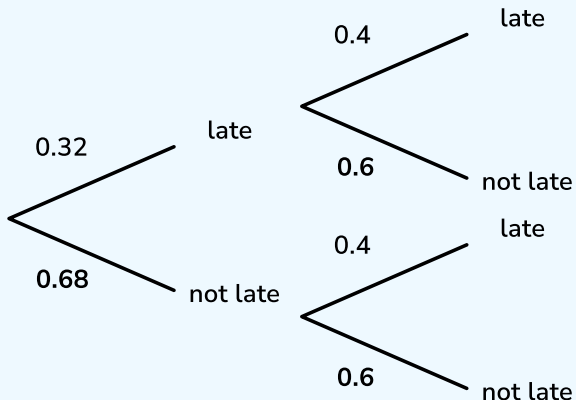
Mark Scheme

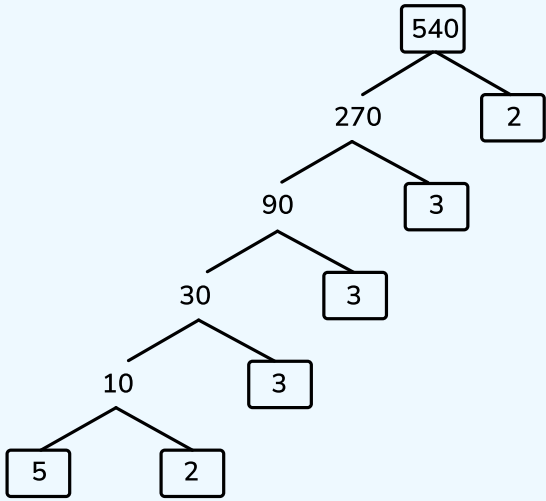
Edexcel GCSE

SET 2

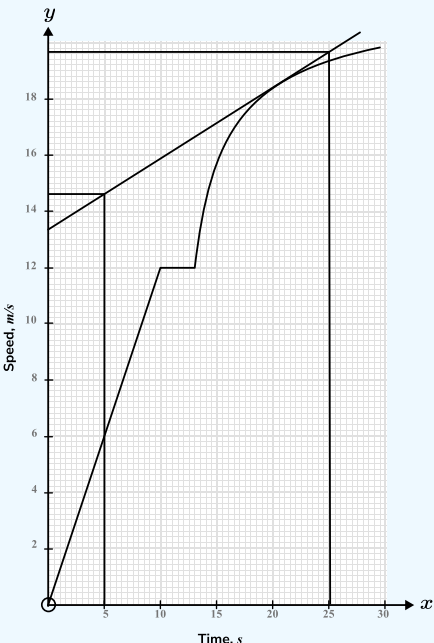
Question	Working	Answer	Notes
Q1a		p^7	A1 cao
Q1b		$4q^5$	M1 $4q^x$ or xq^5 A1 cao
Q2		$8.65 \leq n < 8.75$	A1 8.65 A1 8.75
Q3a	$0 \times 8 + 1 \times 13 + 2 \times 7 + 3 \times 3 + 4 \times 1$ $= 40$ $40 \div 32 = 1.25$	1.25	M1 Multiplying number of siblings by frequencies M1 <i>ft</i> Their sum divided by 32 A1 cao
Q3b	At least two siblings: $7 + 3 + 1 = 11$, $\frac{11}{32} \neq \frac{5}{16}$	No	A1 Correct statement following correct reasoning
Q4a	Angle sum is $(n - 2) \times 180 = 4 \times 180 = 720^\circ$ 6 angles so interior angle is $720 \div 6 = 120^\circ$ Isosceles triangle so angles ABF and AFB equal $180 - 120 = 60$ $60 \div 2 = 30^\circ$	30°	M1 A correct method to find interior angle of hexagon M1 Interior angle of hexagon 120° M1 $\frac{180 - 120}{2}$ oe with either 'angles in a triangle add up to 180° ' or 'isosceles triangle' A1 Correct answer following correct reasoning
Q4b	$180 - 90 - 60 = 30$	30°	M1 Angle CBF = 90° or angle BCF = 60° or indication that AB and CF parallel so alternate angles A1 cao

Question	Working	Answer	Notes
Q5a	Surface area: $2 \times 9 \times 16 = 288$ $2 \times 9 \times x = 18x$ $2 \times 16 \times x = 32x$ $18x + 32x + 288 = 50x + 288$		M1 Attempt to find area of each face M1 Adds all 6 areas M1 Reaches $50x + 288$ following correct method A1 Sets $50x + 288 < 900$
Q5b	$50x < 612$ $x < 12.24$	$x < 12.24$	M1 Subtracting 288 A1 cao
Q5c		12	B1 cao
Q6	$2y = 1.2 \times 10^4$ $4 \times 10^5 + 1.2 \times 10^4$ $400000 + 12000 = 412000$	4.12×10^5	M1 Evidence of correct substitution into $x + 2y$ A1 cao
Q7	$48 \times 100^2 = 480000$	480000	M1 $\times 100^2$ oe seen A1 cao
Q8	Area of garden: $24 \times 10.5 = 252$ $252 \div 20 = 12.6\text{kg}$ of seed needed 12.6 in ratio 2:5 is 3.6:9 3.6kg of wildflower seed: $4 \times \text{£}21 = \text{£}84$ 9kg of grass seed: $2 \times 32 = \text{£}64$ $\text{£}84 + \text{£}64 = \text{£}148$	£148	M1 $252 \div 20 = 12.6\text{kg}$ of seed needed M1 12.6 divided in ratio 2:5 to give 3.6:9 M1 2 bags of grass seed and 4 bags of wildflower seed A1 cao

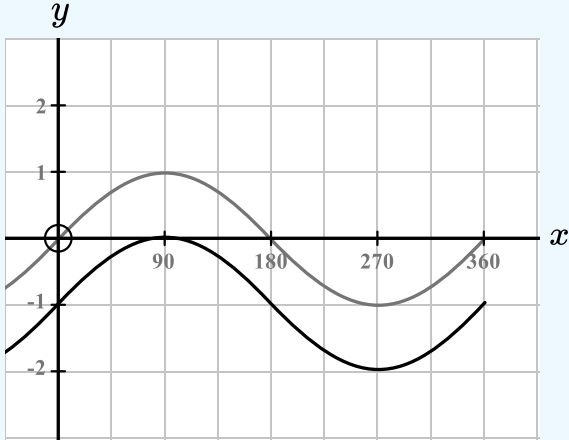
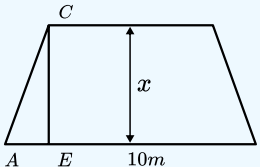
Question	Working	Answer	Notes
Q9a	<p> Saturday Sunday </p> 		A1 cao
Q9b	$0.32 \times 0.4 = 0.128$ $0.32 \times 0.6 = 0.192$ $0.68 \times 0.4 = 0.272$ $0.68 \times 0.6 = 0.408$ $0.192 + 0.272 + 0.408 = 0.872$	0.872	M1 <i>ft</i> from part a - at least one pair of probabilities for Saturday and Sunday multiplied M1 Either $0.32 \times 0.4 = 0.128$ or $0.32 \times 0.6 = 0.192$ $0.68 \times 0.4 = 0.272$ $0.68 \times 0.6 = 0.408$ seen A1 $1 - 0.128 = 0.872$ or $0.192 + 0.272 + 0.408 = 0.872$
Q10	$(6x^2 + 3x - 10x - 5)(x + 2)$ Or $(2x + 1)(3x^2 - 5x + 6x - 10)$ $6x^3 + 5x^2 - 19x - 10$	$6x^3 + 5x^2 - 19x - 10$	M1 $(6x^2 + 3x - 10x - 5)$ or $(3x^2 - 5x + 6x - 10)$ oe M1 $6x^3$ seen A1 cao

Question	Working	Answer	Notes
Q11a		$2^2 \times 3^3 \times 5$ or $2 \times 2 \times 3 \times 3 \times 3 \times 5$	M1 Attempt at a prime factor tree or equivalent method, with at least two prime factors correctly reached A1 Correct product sum written
Q11b		15	A1 cao
Q12	Pressure = $\frac{80}{16} = 5\text{N/cm}^2$ 20% of 5 = 1 5 - 1 = 4N $4 = \frac{80}{A}$ $A = 20\text{cm}^2$ 20 - 16 = 4, $\frac{4}{16} \times 100 = 25\%$	25%	M1 Original pressure = 5N/cm^2 M1 $4 = \frac{80}{A}$ oe seen M1 New area = 20cm^2 A1 $\frac{4}{16} \times 100 = 25\%$
Q13a		$\frac{73}{150}$	A1 cao
Q13b		$\frac{85}{150}$	A1 oe

Question	Working	Answer	Notes
Q13c		$\frac{53}{150}$	A1 cao
Q13d	The denominator should be the number who study German - not the full number of students. It should be $\frac{11}{61}$.		B1 A correct explanation
Q14a	$M_2 = 0.8 \times 4500 = 3600$	3600g	A1 cao
Q14b	$0.8 \times 3600 = 2880$ $0.8 \times 2880 = 2304$ 2304 is close to 2250 so he is correct Or $0.8^3 = 0.512$ which is close to 0.5	Yes	M1 2304 or 0.512 seen B1 Correct statement following correct working
Q15a	The train is going at a constant speed		A1 Correct statement
Q15b	$\frac{1}{2} \times 10 \times 12 = 60$ $3 \times 12 = 36$ $60 + 36 = 96m$	96m	M1 Attempt to find area under graph A1 cao

Question	Working	Answer	Notes
Q15c		0.26m/s^2	<p>M1 Appropriate tangent line drawn with a valid attempt to find gradient</p> <p>A1 $0.24 - 0.28\text{m/s}^2$</p>
Q16	$46 = \frac{k}{\sqrt[3]{125}}$ $k = 46 \times 5 = 230$ $m = \frac{230}{\sqrt[3]{8}} = 115$	115	<p>M1 $46 = \frac{k}{\sqrt[3]{125}}$ oe seen</p> <p>M1 $k = 230$</p> <p>A1 cao</p>
Q17	<p>Angle ABC = 42° (Angles in the same segment are equal)</p> <p>ABC is an isosceles triangle (could be indicated on diagram)</p> <p>Angle ACB = $(180 - 42) \div 2 = 69^\circ$</p> <p>Angle CBF is alternate to angle ACB</p>	69°	<p>M1 Angle ABC = 42°</p> <p>M1 Angle ACB = 69°</p> <p>A1 cao</p>

Question	Working	Answer	Notes
Q18a	Radius of circle: $\frac{20\pi}{2\pi} = 10$ Equation of circle: $x^2 + y^2 = 10^2$	$x^2 + y^2 = 100$	M1 Dividing by 2π to find radius M1 Equation of form $x^2 + y^2 = a^2$ A1 cao
Q18b	Distance of (7, 8) from centre of circle, (0, 0): $\sqrt{7^2 + 8^2} = 10.63\dots$ Radius of circle is 10 It is not inside the circle	It is outside the circle	M1 $\sqrt{7^2 + 8^2} = 10.63\dots$ M1 Comparison of 10.63... to the radius of the circle, 10 A1 Correct conclusion
Q19a		-b + a or a - b	A1 cao
Q19b	$\overrightarrow{AE} = \mathbf{a} + \frac{2}{3}\mathbf{b}$ $\overrightarrow{EF} = \frac{1}{2}\mathbf{a} + \frac{1}{3}\mathbf{b}$ AE is a multiple of EF and they share the point E therefore AEF is a straight line		M1 $\overrightarrow{AE} = \mathbf{a} + \frac{2}{3}\mathbf{b}$ M1 $\overrightarrow{EF} = \frac{1}{2}\mathbf{a} + \frac{1}{3}\mathbf{b}$ B1 One is a multiple of the other B1 They share the point B and form a straight line

Question	Working	Answer	Notes
Q20a			A1 Translation 1 unit down drawn
Q20b		$y = -\cos(x)$ $y = \cos(x) + 2$	A1 One correct equation A1 Two correct equations
Q21	$AC = \sqrt{(1.1x)^2 + 2^2}$ $= \sqrt{1.21x^2 + 4}$  $AE = \sqrt{1.21x^2 + 4 - x^2}$ $= \sqrt{0.21x^2 + 4}$ $CF = 10 - 2\sqrt{0.21x^2 + 4}$		M1 Length of AC or BC = $\sqrt{1.21x^2 + 4}$ M1 AC is common side of triangle and trapezium so recognised as length of diagonal of trapezium M1 'AE' = $\sqrt{1.21x^2 + 4 - x^2}$ A1 Subtract 2AE from CF to give $10 - 2\sqrt{0.21x^2 + 4}$ Working must be correct throughout to achieve final mark

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