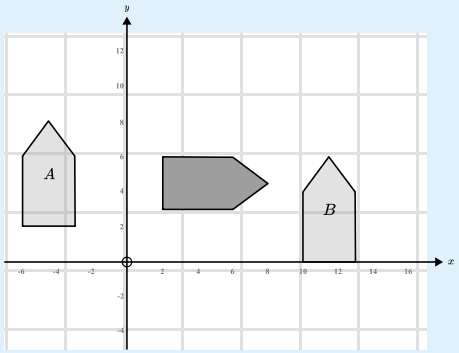
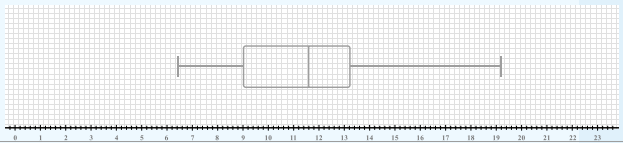
THIRD SPACE LEARNING

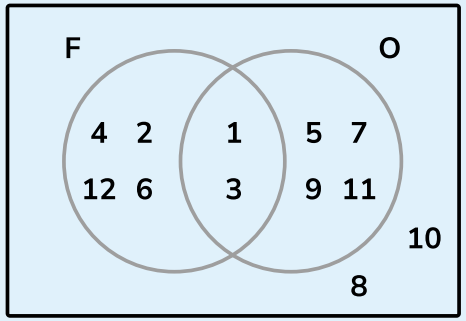
Paper 2 (Calculator) Mark Scheme Higher

Edexcel

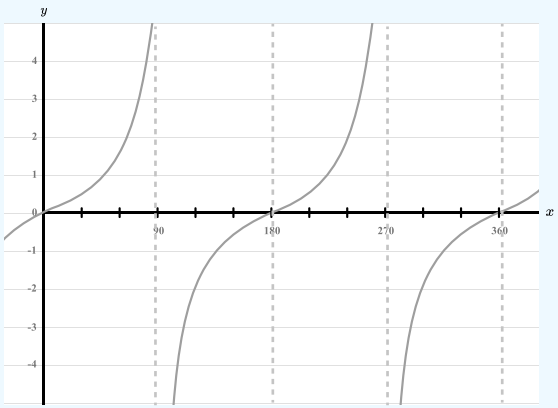
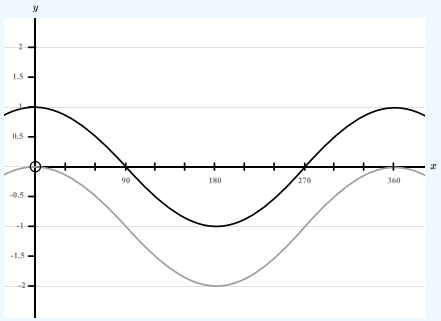
Question	Working	Answer	Notes
Q1a		3706.383333	B1for 4.08900… or 3702.294… B1 cao
Q1b		3710	B1 cao
Q2	3 parts=27 employees $27 \div 3 = 9$ $5 + 8 = 13$ $9 \times 13 = 117$	117	M1 $27 \div 3 = 9$ A1 cao
Q3a	$150 \times 1.19 = €178.50$	€178.50	M1 150×1.19 A1 cao condone €178.5
Q3b	$2 \times 10 + 2 \times 1.95 + 4.25 + 4.20 = €32.35$ $20 + 15 = €35$	Yes	M1 Correctly adding the value of the order A1 Yes with appropriate working seen
Q4a			M1 Any rotation of 90° clockwise A1 cao

Question	Working	Answer	Notes
Q4b	Mark has counted the number of squares between the two shapes	No, correct answer is	A1 No A1 A correct explanation
Q5a	$21q + 15 - 6q + 8$	$15q + 23$	M1 21q, 15, 6q and 8 seen A1 cao
Q5b		$x(x+6)$	A1 cao
Q5c	$6x^2 + 9x - 10x - 15$	$6x^2 - x - 15$	M1 At least two correct of $6x^2 + 9x - 10x - 15$ A1 cao
Q6a	Area of whole garden: $14 \times 9 = 126\text{m}^2$ Area of patio: $4 \times 6 = 24\text{m}^2$ Area of summer house: $4 \times 2.5 = 10\text{m}^2$ $126 - 24 - 10 = 92\text{m}^2$	92m^2	M1 Two of the three areas correct M1 Subtracting their areas for patio and summerhouse from the total area A1 cao
Q6b	$92 \times 100 \times 100 = 920\,000\text{cm}^2$	$920\,000\text{cm}^2$	M1 Attempting to multiply by 100 twice A1 cao
Q7	10% of 12000=1200 12000-1200=£10800 10% of 10800=1080 10800-1080=£9720	£9720	M1 Value after one year £10800 or 12000×0.9^2 seen A1 cao
Q8	$\frac{12a^7b^3}{3a^2b^{-3}} = 4a^5b^6$	$4a^5b^6$	M1 $12a^7b^3$ seen A1 cao

Question	Working	Answer	Notes
Q9a	Ollie: x, Tommy: $x + 12$, Amber: $2x+24$ $x + x + 12 + 2x + 24 = 136$ $4x + 36 = 136$	$4x + 36 = 136$	M1 Attempt to add expressions for all 3 students and put equal to 136 A1 cao
Q9b	$x = 25$	Ollie: 25 Tommy: 37 Amber: 74	M1 $x = 25$ A1 All 3 correct
Q10		$345 \leq mass < 355$	A1 345 A1 355
Q11a	LQ: 8.9, Median: 11.6, UQ: 13.1 Min value: 6.4, Max value 19.1 		M1 At least two of lower quartile, median and upper quartile correct M1 Highest and lowest values correctly marked on box plot A1 cao
Q11b	Median for A 11.6. Median for B 15.8. IQR for A is 13.1-8.9=4.2. IQR for B is 17.2-13.6=3.6.		B1 A statement comparing the median or highest/ lowest values B1 A statement comparing range or interquartile range NOTE - For B2 at least one statement MUST be with context

Question	Working	Answer	Notes
Q12a	$y = 3x - 4$ $y = -\frac{3}{4}x + \frac{10}{4}$	$4y + 3x = 10$ and $y = 2 - \frac{3}{4}x$	M1 Attempting to rearrange at least one equation to find the gradient A1 cao
Q12b	$y = 5x + c$ $2 = 5 \times 2 + c$ $c = -3$	$y = 5x - 3$	M1 $y = 5x + c$ seen A1 cao
Q13a		ξ 	M1 At least 8 values correctly placed A1 cao
Q13b		$\frac{2}{12}$	B1 oe
Q13c		$\frac{4}{6}$	M1 correct numerator or denominator A1 oe
Q14a	$y = \frac{k}{\sqrt{x}}$ $30 = \frac{k}{\sqrt{25}}$ $k = 30 \times 5 = 150$ $y = \frac{150}{\sqrt{16}} = 37.5$	37.5	M1 k=150 seen A1 cao
Q14b	$A = kB^2$ $A = k(2B)^2 = 4Bx^2$	Doubling B multiplies A by 4	B1 No B1 A valid explanation

Question	Working	Answer	Notes
Q15	$\frac{24}{N} = \frac{8}{30}$ $N = \frac{24 \times 30}{8} = 90$	90	M1 $\frac{24}{N} = \frac{8}{30}$ oe A1 cao
Q16	$x^2 - x - 20 \leq 0$ $(x + 4)(x - 5) \leq 0$ $-4 \leq x \leq 5$	$-4 \leq x \leq 5$	M1 Rearranging to $x^2 - x - 20 \leq 0$ M1 Correctly factorising A1 cao
Q17	$\frac{a}{sin(47)} = \frac{10.2}{sin(68)}$ $a = \frac{10.2}{sin(68)} \times sin(47) = 8.04566...$ $cos(x) = \frac{12^2 + 10.5^2 - 8.04566...^2}{2 \times 12 \times 10.5} = 0.75205$ $x = cos^{-1}(0.75205) = 41.2^\circ$	47.2°	M1 $\frac{a}{sin(47)} = \frac{10.2}{sin(68)}$ oe A1 Side length: 8.04566... M1 Use of cosine rule to find angle A1 cao
Q18a	$y = 2x - 1$ $\frac{y + 1}{2} = x$ $g^{-1}(x) = \frac{x + 1}{2}$	$g^{-1}(x) = \frac{x + 1}{2}$	M1 Attempt to make 'y' the subject A1 cao
Q18b	$2(x^2 + 4) - 1$ $2x^2 + 7$	$g(x) = 2x^2 + 7$	M1 Substituting f into g A1 cao
Q19a	$180 - 138 = 42$ $42 \times 2 = 84^\circ$	84°	M1 Angle ABC=42° A1 cao

Question	Working	Answer	Notes
Q19b	Angle OFN 90° since a radius meets a tangent at 90° Angle FON 180-90-x =90-x since angles in a triangle sum to 180 Angle FOE 180-(90-x)=90+x since angles on a straight line sum to 180 Angle FEO $\frac{1}{2}(180-(90+x))=45-\frac{1}{2}x$ since it is isosceles		M1 Correct working to get to $45-\frac{1}{2}x$ B1 At least two valid steps with reasons seen B1 Each step justified
Q20a			B1 cao
Q20b			B1 cao

Question	Working	Answer	Notes
Q20c		**(180, -2)**	**B1 x or y coordinate correct** **B1 cao**
Q21a	**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**
Q21b	$Area = \frac{800}{2825} = 0.28318584$ $Radius = \sqrt{\frac{0.28318584}{\pi}} = 0.30023$ $Volume = \pi \times 0.30023^2(0.1 + \frac{2}{3} \times 0.30023)$ $Volume = 0.085m^3$	$0.085m^3$	**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 ca**

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