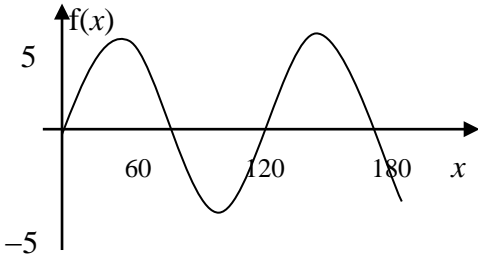


**Edexcel GCE  
Core Mathematics C2  
Practice Paper A6  
(Mark Scheme)**

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Question number	Scheme	Marks
<p><b>1.</b> (a)</p> <p>(b)</p>	<p>Centre is (5, -3) (M1 if sign errors)</p> <p>Radius is 7 (M1 attempts <math>\sqrt{g^2 + f^2 - c}</math>)</p>	<p>M1 A1 (2)</p> <p>M1 A1 (2)</p> <p><b>(4 marks)</b></p>
<p><b>2.</b> (a)</p>	$\frac{y+3}{(y+1)(y+2)} - \frac{y+1}{(y+2)(y+3)} \equiv \frac{(y+3)^2 - (y+1)^2}{(y+1)(y+2)(y+3)}$ $\equiv \frac{(y^2 + 6y + 9) - (y^2 + 2y + 1)}{(y+1)(y+2)(y+3)} \equiv \frac{4y + 8}{(y+1)(y+2)(y+3)}$ $\equiv \frac{4(y+2)}{(y+1)(y+2)(y+3)} \equiv \frac{4}{(y+1)(y+3)} \text{ or } \frac{4}{y^2 + 4y + 3}$	<p>M1</p> <p>M1 A1</p> <p>M1, A1</p> <p><b>(5 marks)</b></p>
<p><b>3.</b></p>	<p><math>\sin 2\theta \div \cos 2\theta = \tan 2\theta</math>, <math>\tan 2\theta = 0.5</math> *</p> <p><math>\tan 2\theta = 0.5</math>, <math>2\theta = 26.6^\circ</math></p> <p><math>2\theta = 206.6</math>, one more soln.</p> <p>386.6, 566.6 other 2 solns in range</p> <p><math>\theta = 13.3, 103.3, 193.3, 283.3</math> (M: dividing by 2)</p>	<p>M1 (1)</p> <p>B1</p> <p>B1 ft</p> <p>B1 ft</p> <p>M1 A1 (5)</p> <p><b>(6 marks)</b></p>
<p><b>4.</b> (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>64 - 16 - 28 + c = 0</math> <math>c = -20</math></p> <p><math>(x - 4)(x^2 + 3x + 5)</math> (B1 for (x - 4))</p> <p>For <math>x^2 + 3x + 5</math>, <math>b^2 - 4ac = -11 &lt; 0</math> <math>\therefore</math> No real roots.</p>	<p>M1 A1 (2)</p> <p>B1 M1 A1 (3)</p> <p>M1 A1 ft (2)</p> <p><b>(7 marks)</b></p>
<p><b>5.</b> (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>\frac{1}{2}r^2\theta = \frac{1}{2}r^2 \times 1.5 = 15</math></p> <p><math>r^2 = 20 = \sqrt{4 \times 5}</math> <math>r = 2\sqrt{5}</math> (*)</p> <p><math>r\theta + 2r = 3\sqrt{5} + 4\sqrt{5} = 7\sqrt{5}</math> cm (or 15.7, or a.w.r.t 15.65...)</p> <p><math>\Delta OAB</math>: <math>\frac{1}{2}r^2 \sin \theta = 10 \sin 1.5 (= 9.9749\dots)</math></p> <p>Segment area = <math>15 - \Delta OAB = 5.025 \text{ cm}^2</math></p>	<p>M1 A1</p> <p>A1 (3)</p> <p>M1 A1 (2)</p> <p>M1</p> <p>M1 A1 (3)</p> <p><b>(8 marks)</b></p>

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<p><b>6.</b> (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	$r = 5.12 \div 6.4 = 0.8$ $a = 6.4 \div 0.64 = 10$ Sum to $\infty = a \div (1 - r) = 10 \div (1 - 0.8) = 50$ $S_{25} = 10(1 - 0.825) \div (1 - 0.8) (= 49.8111)$ $50 - 49.8111 = 0.189$ a.w.r.t 0.19	M1 A1 (2) M1 A1ft (2) M1 A1 (2) M1 A1 ft M1 A1 (4) <b>(10 marks)</b>
<p><b>7.</b> (a)</p> <p>(b)</p> <p>(c)</p>	 (30°, 5); (150°, 5); (90°, -5) coordinate $f(x) = 2.5 \Rightarrow \sin 3x^\circ = \frac{1}{2}$  $3x = 30$ (150, 390, 510) value  $3x = (\alpha), 180 - \alpha, 360 + \alpha, (540 - \alpha)$  $x = 10, 50, 130, 170$	shape B1 60, 120, 180 on x-axis B1 5, -5 on y-axis (may be implied by part (b)) B1 (3)  one x- B1 all x-coordinates B1 all correct B1 (3)  one correct B1  M1, M1 A1 (ignore extras out of range) (4) <b>(10 marks)</b>

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8. (i)	$\arcsin 0.6 = 36.9^\circ$ (awrt) <span style="float: right;"><math>\alpha</math></span> $2x + 50 = 36.87, \quad 2x = -13.13^\circ + 360^\circ = 346.87^\circ$ $2x + 50 + 180 - 36.87, \quad 2x = 143.13^\circ - 50^\circ = 93.13^\circ$ $x = 46.6, \quad 173.4$	B1 M1 M1 M1 M1 A1 A1 (7)
(ii) (a)	$\sin 60^\circ = \frac{\sqrt{3}}{2}, \quad \frac{BC}{\left(\frac{1}{3}\right)} = \frac{18}{\sin 60^\circ}$ $BC = 6 \div \frac{\sqrt{3}}{2} \quad BC = \frac{12}{\sqrt{3}} = 4\sqrt{3}$ (*)	B1, M1 M1 A1 (4)
(b)	$\cos^2 \theta = 1 - \sin^2 \theta = 1 - \frac{1}{9}$ $\sin \theta = \sqrt{\frac{8}{9}} \quad \left( = \frac{\sqrt{8}}{3} = \frac{2\sqrt{2}}{3} \right)$	M1 A1 (2)  <b>(13 marks)</b>

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<p><b>9.</b> (a)</p>	$x^2 - 2x + 3 = 9 - x$ $x^2 - x - 6 = 0 \quad (x + 2)(x - 3) = 0 \quad x = -2, 3$ $y = 11, 6$	<p>M1 M1 A1 M1 A1 ft (5)</p>
<p>(b)</p>	$\int (x^2 - 2x + 3) dx = \frac{x^3}{3} - x^2 + 3x$ $\left[ \frac{x^3}{3} - x^2 + 3x \right]_{-2}^3 = (9 - 9 + 9) - \left( \frac{-8}{3} - 4 - 6 \right) \quad \left( = 21 \frac{2}{3} \right)$ <p>Trapezium: <math>\frac{1}{2} (11 + 6) \times 5 \quad \left( = 42 \frac{1}{2} \right)</math></p> $\text{Area} = 42 \frac{1}{2} - 21 \frac{2}{3} = 20 \frac{5}{6}$ <p><u>Alternative:</u> <math>(9 - x) - (x^2 - 2x + 3) = 6 + x - x^2</math></p> $\int (6 + x - x^2) dx = 6x + \frac{x^2}{2} - \frac{x^3}{3}$ $\left[ 6x + \frac{x^2}{2} - \frac{x^3}{3} \right]_{-2}^3 = \left( 18 + \frac{9}{2} - 9 \right) - \left( -12 + 2 + \frac{8}{3} \right), = 20 \frac{5}{6}$	<p>M1 A1 M1 A1 B1 ft M1 A1 (7) M1 A1 M1 A1 ft M1 A1, A1 (7)  <b>(12 marks)</b></p>