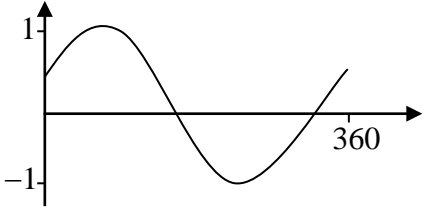


**Edexcel GCE
Core Mathematics C2
Practice Paper B6
(Mark Scheme)**

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Question number	Scheme	Marks
1.	Obtains centre (0, 6.5) Finds radius or diameter by Pythagoras Theorem, to obtain $r = 2.5$ or $r^2 = 6.25$ $x^2 + (y - 6.5)^2 = 2.5^2$ or $x^2 + y^2 - 13y + 36 = 0$	B1 M1, A1 B1 (4 marks)
2.	(a) $a = 4, b = 5$ (both are required) (b) $(x - 4)^2 + (y - 5)^2 = 25$ (c) Finding the distance between centre and (8, 17), $\sqrt{[(8 - a)^2 + (17 - b)^2]}$ Complete method to find PT , i.e. use Pythagoras theorem and subtraction, $PT = 11.6$	B1 (1) M1A1ft (2) M1 M1 A1 (3) (6 marks)
3.	(a) Using $f(\pm 2) = 3$ Showing that $p = 6$ (*), with no wrong working seen. S.C. If $p = 6$ used and the remainder is shown to be 3 award B1 (b) Attempt to find quotient when dividing ($n + 2$) into $f(n)$ or attempting to equate coefficients. Quotient = $n^2 + 4n + 3$, or finding either $q = 1$ or $r = 3$ Finding both $q = 1$ and $r = 3$ (c) The product of three consecutive numbers must be divisible by 3 Complete argument	M1 A1 (2) M1 A1 A1 (3) M1 A1 (2) (7 marks)

Question number	Scheme	Marks
<p>4. (a)</p>  <p>(b) (0, 0.5)(150, 0) (330, 0)</p> <p>(c) $(x + 30 \Rightarrow) 210^\circ$ or 330° $x = 180^\circ, 300^\circ$</p>	<p>Scales (-1, 1 and 360)</p> <p>Shape, position</p> <p>One of these</p> <p>M: Subtract 30, A: Both</p>	<p>B1</p> <p>B1 (2)</p> <p>B1 B1 B1 (3)</p> <p>B1</p> <p>M1 A1 (3)</p> <p>(7 marks)</p>
<p>5.</p> <p>$(2 - px)^6 = 2^6 + \binom{6}{1} 2^5(-px) + \binom{6}{2} 2^4(-px)^2$</p> <p>$x^2$</p> <p>$= 64 + 6 \times 2^5(-px); + 15 \times 2^4(-px)^2$</p> <p>$\binom{n}{r}$</p> <p>$15 \times 16p^2 = 135 \Rightarrow p^2 = \frac{9}{16}$ or $p = \frac{3}{4}$ (only)</p> <p>$-6.32p = A$</p> <p>$\Rightarrow A = -144$</p>	<p>Coeff. of x or</p> <p>No</p>	<p>M1 $\binom{n}{r}$ okay</p> <p>A1; A1</p> <p>M1, A1</p> <p>M1</p> <p>A1 ft (their $p > 0$)</p> <p>(7 marks)</p>
<p>6.</p> <p>$2 \cos^2 \theta - \cos \theta - 1 = 1 - \cos^2 \theta$</p> <p>$3 \cos^2 \theta - \cos \theta - 2 = 0$</p> <p>$(3 \cos \theta + 2)(\cos \theta - 1) = 0 \quad \cos \theta = -\frac{2}{3}$ or 1</p> <p>$\theta = 0 \quad \theta = 131.8^\circ$</p> <p>$\theta = (360 - "131.8")^\circ = 228.2^\circ$</p>		<p>M1</p> <p>A1</p> <p>M1 A1</p> <p>B1 A1</p> <p>M1 A1 ft</p> <p>(8 marks)</p>

Question number	Scheme	Marks
<p>7. (a)</p> <p>(b)</p> <p>(c)</p>	$\frac{1}{2}r^2\theta = \frac{1}{2}r^2 \times 1.5 = 15$ $r^2 = 20 = \sqrt{4 \times 5} \quad r = 2\sqrt{5} \quad (*)$ $r\theta + 2r = 3\sqrt{5} + 4\sqrt{5} = 7\sqrt{5} \text{ cm} \quad (\text{or } 15.7, \text{ or a.w.r.t } 15.65\dots)$ <p>$\Delta OAB: \quad \frac{1}{2}r^2 \sin \theta = 10 \sin 1.5 (= 9.9749\dots)$</p> <p>Segment area = $15 - \Delta OAB = 5.025 \text{ cm}^2$</p>	<p>M1 A1</p> <p>A1 (3)</p> <p>M1 A1 (2)</p> <p>M1</p> <p>M1 A1 (3)</p> <p>(8 marks)</p>
<p>8. (a)</p> <p>(b)</p>	$x^2 - 2x + 3 = 9 - x$ $x^2 - x - 6 = 0 \quad (x + 2)(x - 3) = 0 \quad x = -2, 3$ $y = 11, 6$ $\int (x^2 - 2x + 3) dx = \frac{x^3}{3} - x^2 + 3x$ $\left[\frac{x^3}{3} - x^2 + 3x \right]_{-2}^3 = (9 - 9 + 9) - \left(\frac{-8}{3} - 4 - 6 \right) \quad \left(= 21 \frac{2}{3} \right)$ <p>Trapezium: $\frac{1}{2}(11 + 6) \times 5 \quad \left(= 42 \frac{1}{2} \right)$</p> $\text{Area} = 42 \frac{1}{2} - 21 \frac{2}{3} = 20 \frac{5}{6}$	<p>M1</p> <p>M1 A1</p> <p>M1 A1 ft (5)</p> <p>M1 A1</p> <p>M1 A1</p> <p>B1 ft</p> <p>M1 A1 (7)</p> <p>(12 marks)</p>

Question number	Scheme	Marks
9. (a)	$\frac{dy}{dx} = 4x^3 - 16x$	M1 A1 (2)
(b)	$4x^3 - 16x = 0$ $4x(x^2 - 4) = 0$	M1
(c)	$\frac{d^2y}{dx^2} = 12x^2 - 16$ ft $x = 0$ Max. $x = 2$ Min. $x = -2$ Min.	A2 (1, 0) M1 A1 (5) M1 One of these, All three A1ft A1 (3)
(d)	$x = 1: y = 1 - 8 + 3 = -4$ At $x = 1,$ $\frac{dy}{dx} = 4 - 16 = -12$ (m) Gradient of normal = $-\frac{1}{m}$ $\left(= \frac{1}{12} \right)$	B1 B1 ft M1
	$y - (-4) = \frac{1}{12}(x - 1)$	$x - 12y - 49 = 0$ M1 A1 (5) (15 marks)