

**Edexcel GCE  
Core Mathematics C2  
Gold Level G1  
(Mark Scheme)**

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Question Number	Scheme	Marks
1.	$(3 - 2x)^5 = 243, \dots + 5 \times (3)^4(-2x) = -810x \dots$ $+ \frac{5 \times 4}{2}(3)^3(-2x)^2 = +1080x^2$	B1, B1 M1 A1 <b>[4]</b>
2. (a)	$\{(3 + bx)^5\} = (3)^5 + {}^5C_1(3)^4(bx) + {}^5C_2(3)^3(bx)^2 + \dots$ $= 243 + 405bx + 270b^2x^2 + \dots$	B1 B1 M1 A1 (4)
(b)	$\{2(\text{coeff } x) = \text{coeff } x^2\} \Rightarrow 2(405b) = 270b^2$ So, $\left\{b = \frac{810}{270} \Rightarrow\right\} b = 3$	M1 A1 (2) <b>[6]</b>
3. (a)	$\left(1 + \frac{1}{2}x\right)^{10} = 1 + \binom{10}{1}\left(\frac{1}{2}x\right) + \binom{10}{2}\left(\frac{1}{2}x\right)^2 + \binom{10}{3}\left(\frac{1}{2}x\right)^3$ $= 1 + 5x; + \frac{45}{4}(\text{or } 11.25)x^2 + 15x^3$	M1 A1 A1; A1 (4)
(b)	$(1 + \frac{1}{2} \times 0.01)^{10} = 1 + 5(0.01) + (\frac{45}{4} \text{ or } 11.25)(0.01)^2 + 15(0.01)^3$ $= 1 + 0.05 + 0.001125 + 0.000015$ $= 1.05114 \text{ cao}$	M1 A1√ A1 (3) <b>[7]</b>
4. (a)	$\log_x 64 = 2 \Rightarrow 64 = x^2$ So $x = 8$	M1 A1 (2)
(b)	$\log_2(11 - 6x) = \log_2(x - 1)^2 + 3$ $\log_2\left[\frac{11 - 6x}{(x - 1)^2}\right] = 3$ $\frac{11 - 6x}{(x - 1)^2} = 2^3$ $\{11 - 6x = 8(x^2 - 2x + 1)\}$ and so $0 = 8x^2 - 10x - 3$ $0 = (4x + 1)(2x - 3) \Rightarrow x = \dots$ $x = \frac{3}{2}, \left[-\frac{1}{4}\right]$	M1 M1 M1 M1 A1 dM1 A1 (6) <b>[8]</b>

Question Number	Scheme	Marks
<p>5. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	$T_{20} = 5 \times \left(\frac{4}{5}\right)^{19} = 0.072$ $S_{\infty} = \frac{5}{1-0.8} = 25$ $\frac{5(1-0.8^k)}{1-0.8} > 24.95$ $1-0.8^k > 0.998 \text{ or equivalent}$ $k \log 0.8 < \log 0.002 \text{ or } k > \log_{0.8} 0.002$ $k > \frac{\log 0.002}{\log 0.8}$ $k = 28$	<p>M1 A1</p> <p>(2)</p> <p>M1 A1</p> <p>(2)</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1 cso</p> <p>(4)</p> <p>B1</p> <p>(1)</p> <p>[9]</p>
<p>6. (a)</p> <p>(b)</p>	$x^2 + 2x + 2 = 10 \Rightarrow x^2 + 2x - 8 = 0 \text{ ( so } (x+4)(x-2) = 0 \text{ ) } \Rightarrow x = \dots\dots$ $x = -4, 2$ $\int (x^2 + 2x + 2) dx = \frac{x^3}{3} + \frac{2x^2}{2} + 2x (+C)$ $\left[ \frac{x^3}{3} + \frac{2x^2}{2} + 2x \right]_{-4}^{2} = \left( \frac{8}{3} + \frac{8}{2} + 4 \right) - \left( -\frac{64}{3} + \frac{32}{2} - 8 \right) \quad (= 24)$ <p>Rectangle: <math>10 \times (2 - -4) = 60</math></p> $R = "60" - "24"$ $= 36$	<p>M1</p> <p>A1</p> <p>(2)</p> <p>M1 A1</p> <p>A1</p> <p>M1</p> <p>B1 cao</p> <p>M1</p> <p>A1</p> <p>(7)</p> <p>[9]</p>

Question Number	Scheme	Marks
<p>7. (a)</p> <p>(b)</p> <p>(c)</p>	$\{V = \} \quad 2x^2y = 81$ $\{L = 2(2x + x + 2x + x) + 4y \Rightarrow L = 12x + 4y\}$ $y = \frac{81}{2x^2} \Rightarrow L = 12x + 4\left(\frac{81}{2x^2}\right)$ $\text{So, } L = 12x + \frac{162}{x^2} \quad \text{AG}$ $\frac{dL}{dx} = 12 - \frac{324}{x^3} \quad \{= 12 - 324x^{-3}\}$ $\left\{\frac{dL}{dx} = \right\} 12 - \frac{324}{x^3} = 0 \Rightarrow x^3 = \frac{324}{12}; = 27 \Rightarrow x = 3$ $\{x = 3,\} \quad L = 12(3) + \frac{162}{3^2} = 54 \text{ (cm)}$ $\{\text{For } x = 3\}, \quad \frac{d^2L}{dx^2} = \frac{972}{x^4} > 0 \Rightarrow \text{Minimum}$	<p>B1 oe</p> <p>M1</p> <p>A1 cso</p> <p>(3)</p> <p>M1</p> <p>A1 aef</p> <p>M1;</p> <p>A1 cso</p> <p>ddM1</p> <p>A1 cao</p> <p>(6)</p> <p>M1 A1</p> <p>(2)</p> <p>[11]</p>
<p>8. (a)</p> <p>(b)</p>	<p>45 <math>(\alpha)</math></p> <p>180 – <math>\alpha</math> ,                      Add 20 (for at least one angle)</p> <p>65 155</p> <p>120 or 240 <math>(\beta)</math>:</p> <p>360 – <math>\beta</math> , 360 + <math>\beta</math></p> <p>Dividing by 3 (for at least one angle)</p> <p>40 80 160 200 280 320</p>	<p>B1</p> <p>M1 M1</p> <p>A1</p> <p>(4)</p> <p>B1</p> <p>M1 M1</p> <p>M1</p> <p>A1 A1</p> <p>(6)</p> <p>[10]</p>

Question Number	Scheme	Marks	
9. (a)	$(10-2)^2 + (7-1)^2$ or $\sqrt{(10-2)^2 + (7-1)^2}$	M1 A1	
	$(x \pm 2)^2 + (y \pm 1)^2 = k$ ( $k$ a positive <u>value</u> )	M1	
	$(x-2)^2 + (y-1)^2 = 100$	A1	
		(4)	
	(b)	(Gradient of radius $\Rightarrow \frac{7-1}{10-2} = \frac{6}{8}$ (o.e.))	B1
		Gradient of tangent $= \frac{-4}{3}$	M1
		$y-7 = m(x-10)$	M1
		$y-7 = \frac{-4}{3}(x-10)$ (o.e.)	A1ft
			(4)
	(c)	$\sqrt{r^2 - \left(\frac{r}{2}\right)^2}$	M1
$= \sqrt{10^2 - 5^2}$ (o.e.)		A1	
$PQ (= 2\sqrt{75}) = 10\sqrt{3}$		A1 (3) <b>[8]</b>	

## Statistics for C2 Practice Paper Gold Level G1

Qu	Max score	Modal score	Mean %	Mean score for students achieving grade:							
				ALL	A*	A	B	C	D	E	U
1	4		76	3.05		3.70	3.26	2.91	2.58	2.21	1.43
2	6		74	4.46	5.82	5.70	5.22	4.66	4.04	3.34	2.00
3	7		66	4.62		6.35	4.91	4.39	3.51	2.90	1.66
4	8		57	4.59		6.73	4.83	3.73	2.47	2.10	1.24
5	9		61	5.50		7.47	6.37	5.43	4.56	3.87	2.31
6	9		86	7.74	8.95	8.58	8.06	7.60	6.89	6.32	3.59
7	11		53	5.87	10.38	9.49	7.44	5.58	3.88	2.60	0.95
8	10		55	5.53		8.62	6.73	5.34	4.03	2.72	1.22
9	11		54	5.92	10.11	8.69	7.36	6.32	4.92	3.31	1.16
	<b>75</b>		<b>63</b>	<b>47.28</b>		<b>65.33</b>	<b>54.18</b>	<b>45.96</b>	<b>36.88</b>	<b>29.37</b>	<b>15.56</b>