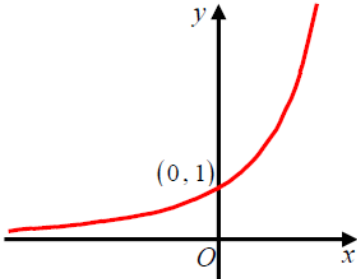


**Edexcel GCE**  
**Core Mathematics C2**  
**Silver Level S2**  
**(Mark Scheme)**

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Mr.S.V.Swarnaraja (Marking Examiner, Team Leader & Author)  
www.swanash.com, Mobile: +94777304755 , email: swa@swanash.com**



Question Number	Scheme	Marks
<p><b>4. (a)</b></p> <p><b>(b)</b></p>	$3 \sin^2 \theta - 2 \cos^2 \theta = 1$ $3 \sin^2 \theta - 2(1 - \sin^2 \theta) = 1$ $3 \sin^2 \theta - 2 + 2 \sin^2 \theta = 1$ $5 \sin^2 \theta = 3$ <p style="text-align: right;">cso</p> <p><math>\sin^2 \theta = \frac{3}{5}</math>, so <math>\sin \theta = (\pm)\sqrt{0.6}</math></p> <p>Attempt to solve both <math>\sin \theta = + \dots</math> and <math>\sin \theta = - \dots</math></p> <p><math>\theta = 50.7685^\circ</math> awrt <math>\theta = 50.8^\circ</math></p> <p><math>\theta (= 180^\circ - 50.7685^\circ)</math>; <math>\theta = 129.23\dots^\circ</math> awrt <math>129.2^\circ</math></p> <p><math>\sin \theta = -\sqrt{0.6}</math></p> <p><math>\theta = 230.785^\circ</math> and <math>309.23152^\circ</math> awrt <math>230.8^\circ, 309.2^\circ</math></p>	<p>M1</p> <p>A1 (2)</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>M1; A1</p> <p>M1A1 (7) [9]</p>
<p><b>5. (a)(i)</b></p> <p><b>(ii)</b></p> <p><b>(b)</b></p> <p><b>(c)</b></p>	<p>The centre is at (10, 12)</p> <p>Uses <math>(x - 10)^2 + (y - 12)^2 = -195 + 100 + 144 \Rightarrow r = \dots</math></p> <p>Completes the square for both <math>x</math> and <math>y</math> in an attempt to find <math>r</math>.</p> <p><math>(x \pm "10")^2 \pm a</math> and <math>(y \pm "12")^2 \pm b</math> and <math>+195 = 0, (a, b \neq 0)</math></p> $r = \sqrt{10^2 + 12^2 - 195}$ $r = 7$ $MN = \sqrt{(25 - "10")^2 + (32 - "12")^2}$ $MN (= \sqrt{625}) = 25$ $NP = \sqrt{("25")^2 - ("7")^2}$ $NP (= \sqrt{576}) = 24$	<p>B1 B1</p> <p>M1</p> <p>A1</p> <p>A1 (5)</p> <p>M1</p> <p>A1 (2)</p> <p>M1</p> <p>A1 (2) [9]</p>
<p><b>6. (a)</b></p> <p><b>(b)</b></p>	<p><math>f(2) = 16 + 40 + 2a + b</math> or <math>f(-1) = 1 - 5 - a + b</math></p> <p>Finds 2nd remainder and equates to 1st <math>\Rightarrow 16 + 40 + 2a + b = 1 - 5 - a + b</math></p> <p><math>a = -20</math></p> <p><math>f(-3) = (-3)^4 + 5(-3)^3 - 3a + b = 0</math></p> <p><math>81 - 135 + 60 + b = 0</math> gives <math>b = -6</math></p>	<p>M1 A1</p> <p>M1 A1</p> <p>A1cso (5)</p> <p>M1 A1ft</p> <p>A1 cso (3) [8]</p>

Question Number	Scheme	Marks
7. (a)	Gradient of $AM$ : $\frac{1 - (-2)}{3 - 1} = \frac{3}{2}$ Gradient of $l$ : $= -\frac{2}{3}$ $y - 1 = -\frac{2}{3}(x - 3)$ or $\frac{y - 1}{x - 3} = -\frac{2}{3}$ $[3y = -2x + 9]$ (b) $x = 6$ : $3y = -12 + 9 = -3$ $y = -1$ (c) $(r^2 =)$ $(6 - 1)^2 + (-1 - (-2))^2$ $(x \pm 6)^2 + (y \pm 1)^2 = k, \quad k \neq 0$ $(x - 6)^2 + (y + 1)^2 = 26$ (oe)	B1 M1 M1 A1 (4) B1 (1) M1 A1 M1 A1 (4) <b>[9]</b>
8. (a)	Graph of $y = 7^x, x \in \mathbb{R}$ and solving $7^{2x} - 4(7^x) + 3 = 0$  <p style="text-align: right;">At least two of the three criteria correct.</p> <p style="text-align: right;">All three criteria correct.</p>	B1 B1 (2) M1 A1 A1 A1 dM1 A1 B1 (6) <b>[8]</b>
	(b) $y^2 - 4y + 3 = 0$ $\{ (y - 3)(y - 1) = 0 \text{ or } (7x - 3)(7x - 1) = 0 \}$ $y = 3, y = 1$ or $7x = 3, 7x = 1$ $\{7^x = 3 \Rightarrow\} x \log 7 = \log 3$ or $x = \frac{\log 3}{\log 7}$ or $x = \log_7 3$ $x = 0.5645\dots$ $x = 0$	

Question Number	Scheme	Marks
<p>9. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>(Total area) = <math>3xy + 2x^2</math></p> <p>(Vol:) <math>x^2y = 100</math>      <math>(y = \frac{100}{x^2}, xy = \frac{100}{x})</math></p> <p>Deriving expression for area in terms of x only</p> <p>(Area =) <math>\frac{300}{x} + 2x^2</math></p> <p><math>\frac{dA}{dx} = -\frac{300}{x^2} + 4x</math></p> <p>Setting <math>\frac{dA}{dx} = 0</math> and finding a correct power of x</p> <p><math>x = 4.2172</math>      awrt 4.22</p> <p><math>\frac{d^2A}{dx^2} = \frac{600}{x^3} + 4 = \text{positive, } &gt; 0;</math>      therefore minimum</p> <p>Substituting found value of x into (a)</p> <p><math>[y = \frac{100}{4.2172^2} = 5.6228]</math></p> <p>Area = 106.707      awrt 107</p>	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1 cso</p> <p>(4)</p> <p>M1A1</p> <p>M1</p> <p>A1</p> <p>(4)</p> <p>M1;A1</p> <p>(2)</p> <p>M1</p> <p>A1</p> <p>(2)</p> <p><b>[12]</b></p>

## Statistics for C2 Practice Paper Silver Level S2

Qu	Max score	Modal score	Mean %	Mean score for students achieving grade:							
				ALL	A*	A	B	C	D	E	U
1	4		80	3.21	3.95	3.82	3.62	3.41	3.13	2.76	1.76
2	7		79	5.50	6.89	6.70	6.37	6.02	5.39	4.61	2.59
3	9		69	6.23	8.75	8.12	7.12	6.43	5.81	5.10	3.34
4	9		65	5.87		7.83	6.59	5.89	4.84	3.68	1.88
5	9		72	6.52	8.90	8.28	7.15	6.07	5.18	3.94	1.76
6	8		71	5.69		7.30	6.20	5.29	4.32	3.53	2.23
7	9		66	5.97		8.44	7.50	6.44	5.10	3.71	1.43
8	8		64	5.09	7.74	7.12	5.65	4.41	3.29	2.45	1.32
9	12		63	7.57		11.29	9.21	6.64	4.33	3.09	1.20
	<b>75</b>		<b>69</b>	<b>51.65</b>		<b>68.90</b>	<b>59.41</b>	<b>50.60</b>	<b>41.39</b>	<b>32.87</b>	<b>17.51</b>