
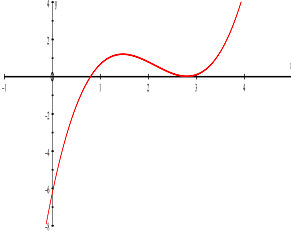



**Edexcel GCE
Core Mathematics C1
Silver Level S4
(Mark Scheme)**

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Question Number	Scheme	Marks
<p>1. (a)</p> <p>(b)</p>	<p>5 (± 5 is B0)</p> $\frac{1}{(\text{their } 5)^2} \text{ or } \left(\frac{1}{\text{their } 5}\right)^2$ $= \frac{1}{25} \text{ or } \mathbf{0.04}$ <p style="text-align: right;">($\pm \frac{1}{25}$ is A0)</p>	<p>B1</p> <p>(1)</p> <p>M1</p> <p>A1</p> <p>(2)</p> <p>[3]</p>
<p>2.</p>	$\frac{15}{\sqrt{3}} = \frac{15}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 5\sqrt{3}$ $\sqrt{27} = 3\sqrt{3}$ $\frac{15}{\sqrt{3}} - \sqrt{27} = 2\sqrt{3}$	<p>M1A1</p> <p>B1</p> <p>A1</p> <p>[4]</p>
<p>3. (i)</p> <p>(ii)</p>	<p>(5 - $\sqrt{8}$)(1 + $\sqrt{2}$)</p> $= 5 + 5\sqrt{2} - \sqrt{8} - 4$ $= 5 + 5\sqrt{2} - 2\sqrt{2} - 4$ $= 1 + 3\sqrt{2}$ <p>Method 1 Method 2 Method 3</p> <p>Either Or Or</p> $\sqrt{80} + \frac{30}{\sqrt{5}} \left(\frac{\sqrt{5}}{\sqrt{5}}\right)$ $= 4\sqrt{5} + \dots$ $= 4\sqrt{5} + 6\sqrt{5}$ $\left(\frac{\sqrt{400} + 30}{\sqrt{5}}\right) \frac{\sqrt{5}}{\sqrt{5}}$ $= \left(\frac{20 + \dots}{\dots}\right) \dots$ $= \left(\frac{50\sqrt{5}}{5}\right)$ $= 10\sqrt{5}$ $\sqrt{80} + \frac{\sqrt{900}}{\sqrt{5}} = \sqrt{80} + \sqrt{180}$ $= 4\sqrt{5} + \dots$ $= 4\sqrt{5} + 6\sqrt{5}$	<p>M1</p> <p>B1</p> <p>A1</p> <p>(3)</p> <p>M1</p> <p>B1</p> <p>A1</p> <p>(3)</p> <p>[6]</p>

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<p>4. (a)</p> <p>(b)</p> <p>(c)</p>	<p>$5x > 10, x > 2$ [Condone $x > \frac{10}{2} = 2$]</p> <p>$(2x+3)(x-4) = 0$, 'Critical values' are $-\frac{3}{2}$ and 4</p> <p>$-\frac{3}{2} < x < 4$</p> <p>$2 < x < 4$</p>	<p>M1, A1 (2)</p> <p>M1, A1</p> <p>M1 A1ft (4)</p> <p>B1ft (1)</p> <p>[7]</p>
<p>5. (a)</p> <p>(b)</p>	<p>$2^y = 8 \Rightarrow y = 3$</p> <p>$8 = 2^3$</p> <p>$4^{x+1} = (2^2)^{x+1}$ or $(2^{x+1})^2$</p> <p>$2^{3x+2} = 2^3 \Rightarrow 3x+2 = 3 \Rightarrow x = \frac{1}{3}$</p>	<p>B1 cao (1)</p> <p>M1</p> <p>M1</p> <p>M1A1 (4)</p> <p>[5]</p>
<p>6. (a)</p> <p>(b)</p>	<p>$2x^2 - x(x-4) = 8$</p> <p>$x^2 + 4x - 8 = 0$</p> <p>$x = \frac{-4 \pm \sqrt{4^2 - (4 \times 1 \times -8)}}{2}$ or $(x+2)^2 \pm 4 - 8 = 0$</p> <p>$x = -2 \pm$ (any correct expression)</p> <p>$\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$ or $\sqrt{12} = \sqrt{4}\sqrt{3} = 2\sqrt{3}$</p> <p>$y = (-2 \pm 2\sqrt{3}) - 4$</p> <p>$x = -2 + 2\sqrt{3}, y = -6 + 2\sqrt{3}$ $x = -2 - 2\sqrt{3}, y = -6 - 2\sqrt{3}$</p>	<p>M1</p> <p>(*) A1cso (2)</p> <p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>(5)</p> <p>[7]</p>

Question Number	Scheme	Marks
<p>7.</p> <p>(a)</p> <p>T:</p> <p>T:</p> <p>(b)</p>	<p>$P(4, -1)$ lies on C where $f'(x) = \frac{1}{2}x - \frac{6}{\sqrt{x}} + 3, x > 0$</p> <p>$f'(4) = \frac{1}{2}(4) - \frac{6}{\sqrt{4}} + 3; = 2$</p> <p>$y - -1 = 2(x - 4)$</p> <p>$y = 2x - 9$</p> <p>$f(x) = \frac{x^{1+1}}{2(2)} - \frac{6x^{-\frac{1}{2}+1}}{(\frac{1}{2})} + 3x (+ c)$</p> <p>$\{f(4) = -1 \Rightarrow \frac{16}{4} - 12(2) + 3(4) + c = -1$</p> <p>$\{4 - 24 + 12 + c = -1 \Rightarrow c = 7\}$</p> <p>So, $\{f(x) = \frac{x^2}{2(2)} - \frac{6x^{\frac{1}{2}}}{(\frac{1}{2})} + 3x + 7$</p>	<p>M1; A1</p> <p>dM1</p> <p>A1</p> <p>(4)</p> <p>o.e. M1 A1</p> <p>dM1</p> <p>A1 cso</p> <p>(4)</p> <p>[8]</p>
<p>8. (a)</p> <p>(b)</p>  <p>(c)</p> <p>(d)</p> 	<p>$[y = x^3 + 2x^2]$ so $\frac{dy}{dx} = 3x^2 + 4x$</p> <p>Shape </p> <p>Touching x-axis at origin</p> <p>Through and not touching or stopping at -2 on x-axis. Ignore extra intersections.</p> <p>At $x = -2$: $\frac{dy}{dx} = 3(-2)^2 + 4(-2) = 4$</p> <p>At $x = 0$: $\frac{dy}{dx} = 0$ (Both values correct)</p> <p>Horizontal translation (touches x-axis still)</p> <p>$k - 2$ and k marked on positive x-axis</p> <p>$k^2(2 - k)$ (o.e) marked on negative y-axis</p>	<p>M1A1</p> <p>(2)</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>(3)</p> <p>M1</p> <p>A1</p> <p>(2)</p> <p>M1</p> <p>B1</p> <p>B1</p> <p>(3)</p> <p>[10]</p>

Question Number	Scheme	Marks
<p>9. (a)</p>	<p>Method 1: Attempts $b^2 - 4ac$ for $a = (k + 3)$, $b = 6$ and their c. $c \neq k$ $b^2 - 4ac = 6^2 - 4(k + 3)(k - 5)$ $(b^2 - 4ac =) -4k^2 + 8k + 96$ or $-(b^2 - 4ac =) 4k^2 - 8k - 96$ As $b^2 - 4ac > 0$, then $-4k^2 + 8k + 96 > 0$ and so, $k^2 - 2k - 24 < 0$</p> <p>Method 2: Considers $b^2 > 4ac$ for $a = (k + 3)$, $b = 6$ and their c. $c \neq k$ $6^2 > 4(k + 3)(k - 5)$ $4k^2 - 8k - 96 < 0$ or $-4k^2 + 8k + 96 > 0$ or $9 > (k + 3)(k - 5)$ and so, $k^2 - 2k - 24 < 0$ following correct work</p>	<p>M1 A1 B1 A1</p> <p>M1 A1 B1 A1</p> <p>(4)</p> <p>M1</p> <p>M1 A1 (3) [7]</p>
<p>10. (a)</p>	<p>$y - 5 = -\frac{1}{2}(x - 2)$ or equivalent, e.g. $\frac{y - 5}{x - 2} = -\frac{1}{2}$</p> <p>(b) $y = -\frac{1}{2}x + 6$ $x = -2 \Rightarrow y = -\frac{1}{2}(-2) + 6 = 7$ (therefore B lies on the line)</p> <p>(c) $(AB^2 =) (2 - (-2))^2 + (7 - 5)^2, = 16 + 4 = 20, AB = \sqrt{20} = 2\sqrt{5}$</p> <p>(d) C is $(p, -\frac{1}{2}p + 6)$, so $AC^2 = (p - 2)^2 + \left(-\frac{1}{2}p + 6 - 5\right)^2$</p> <p>Therefore $25 = p^2 - 4p + 4 + \frac{1}{4}p^2 - p + 1$ $25 = 1.25p^2 - 5p + 5$ or $100 = 5p^2 - 20p + 20$ (or better, RHS simplified to 3 terms)</p> <p>Leading to: $0 = p^2 - 4p - 16$ (*)</p>	<p>M1A1, A1cao (3)</p> <p>B1 (1)</p> <p>M1, A1, A1 (3)</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>A1cso (4) [11]</p>

Question Number	Scheme	Marks
<p>11. (a)</p> <p>(b)</p> <p>(c)</p>	$u_{25} = a + 24d = 30 + 24 \times (-1.5)$ $= -6$ $a + (n-1)d = 30 - 1.5(r-1) = 0$ $r = 21$ $S_{20} = \frac{20}{2} \{60 + 19(-1.5)\} \text{ or } S_{21} = \frac{21}{2} \{60 + 20(-1.5)\} \text{ or}$ $S_{21} = \frac{21}{2} \{30 + 0\}$ $= 315$	<p>M1</p> <p>A1 (2)</p> <p>M1</p> <p>A1 (2)</p> <p>M1 A1ft</p> <p>A1 (3)</p> <p>[7]</p>

Statistics for C1 Practice Paper Silver Level S4

Qu	Max score	Modal score	Mean %	Mean score for students achieving grade:							
				ALL	A*	A	B	C	D	E	U
1	3		82	2.47		2.91	2.85	2.57	2.44	2.04	1.63
2	4		87	3.46	4.00	3.87	3.72	3.26	3.04	2.68	1.53
3	6		73	4.36	5.98	5.48	4.84	4.25	3.93	3.61	2.78
4	7		70	4.90		6.41	5.61	5.12	4.58	3.98	2.63
5	5		86	4.32	4.99	4.91	4.55	4.15	3.97	3.55	2.62
6	7		63	4.41		5.76	5.10	4.70	4.23	3.59	2.32
7	8		64	5.11	7.78	7.30	6.61	5.78	4.85	3.70	1.78
8	10		59	5.92	9.41	8.64	7.25	6.46	5.45	4.92	3.05
9	7		58	4.06	6.89	6.35	5.40	4.40	3.61	3.00	1.59
10	11		59	6.52		9.78	7.86	7.02	6.39	5.86	4.00
11	7		57	3.99		5.91	4.72	3.91	3.36	2.92	1.87
	75		66	49.52		67.32	58.51	51.62	45.85	39.85	25.80