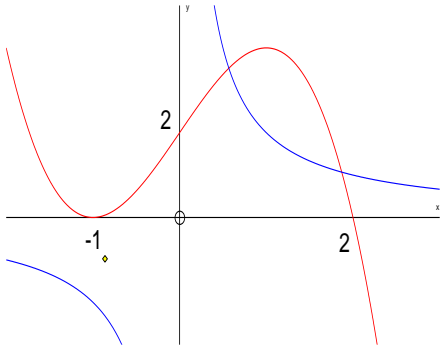
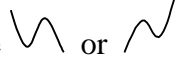



**Edexcel GCE  
Core Mathematics C1  
Gold Level G1  
(Mark Scheme)**

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Question Number	Scheme	Marks
1.	$y = x^3 + 4x + 1 \Rightarrow \frac{dy}{dx} = 3x^2 + 4(+0)$ substitute $x = 3 \Rightarrow$ gradient = 31	M1A1 M1 A1 cao <b>[4]</b>
2. (a)	2	B1 (1)
(b)	$x^9$ seen, or (answer to (a)) <sup>3</sup> seen, or $(2x^3)^3$ seen. $8x^9$	M1 A1 (2) <b>[3]</b>
3. (a)	$3x - 6 < 8 - 2x \rightarrow 5x < 14$ (Accept $5x - 14 < 0$ (o.e.)) $x < 2.8$ or $\frac{14}{5}$ or $2\frac{4}{5}$ (condone $\leq$ )	M1 A1 (2)
(b)	Critical values are $x = \frac{7}{2}$ and $-1$ Choosing “inside” $-1 < x < \frac{7}{2}$	B1 M1 A1 (3)
(c)	$-1 < x < 2.8$ Accept any exact equivalents to $-1, 2.8, 3.5$	B1ft (1) <b>[6]</b>
4. (a)	$a + 9d = 2400 \quad a + 39d = 600$ $d = \frac{-1800}{30} \quad d = -60$ (accept $\pm 60$ for A1)	M1 M1 A1 (3)
(b)	$a - 540 = 2400 \quad a = 2940$	M1 A1 (2)
(c)	$\text{Total} = \frac{1}{2}n\{2a + (n-1)d\} = \frac{1}{2} \times 40 \times (5880 + 39 \times -60)$ $= \underline{70\,800}$ (ft values of $a$ and $d$ )	M1 A1ft A1cao (3) <b>[8]</b>

Question Number	Scheme	Marks
<p>5. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p><math>x_2 = 1 - k</math></p> <p><math>x_3 = (1 - k)^2 - k(1 - k)</math>  <math>= 1 - 3k + 2k^2</math>*</p> <p><math>1 - 3k + 2k^2 = 1</math>  <math>(2k^2 - 3k = 0)</math>  <math>k(2k - 3) = 0 \Rightarrow k = ..</math>  <math>k = \frac{3}{2}</math></p> <p>Or <math>\sum_{n=1}^{100} x_n = 1 + \left(-\frac{1}{2}\right) + 1 + \dots</math>  Or <math>= 1 + (1 - 'k') + 1 + \dots</math></p> <p><math>50 \times \frac{1}{2}</math> or <math>50 \times 1 - 50 \times \frac{1}{2}</math> or <math>\frac{1}{2} \times 50 \times \left(1 - \frac{1}{2}\right)</math>  <math>= 25</math></p>	<p>B1 (1)</p> <p>M1 A1* (2)</p> <p>M1 dM1 A1 Cao cso (3)</p> <p>M1 M1 A1 (3) [9]</p>
<p>6. (a)</p> <p>(b)</p>	<p><math>b^2 - 4ac &gt; 0 \Rightarrow 16 - 4k(5 - k) &gt; 0</math> or equiv., e.g. <math>16 &gt; 4k(5 - k)</math>  So <math>k^2 - 5k + 4 &gt; 0</math>  (Allow any order of terms, e.g. <math>4 - 5k + k^2 &gt; 0</math>) (*)</p> <p><u>Critical Values</u> <math>(k - 4)(k - 1) = 0</math> <math>k = \dots</math>  <math>k = 1</math> or <math>4</math>  Choosing "outside" region  <u><math>k &lt; 1</math> or <math>k &gt; 4</math></u></p>	<p>M1A1 A1cso (3)</p> <p>M1 A1 M1 A1 (4) [7]</p>

Question Number	Scheme	Marks
<p>7. (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>(a =) (1+1)^2(2-1) = \underline{4}</math>      <math>(1, 4)</math> or <math>y = 4</math> is also acceptable</p>  <p>(i) Shape  or  anywhere  Min at <math>(-1, 0)</math> ... can be <math>-1</math> on <math>x</math>-axis.  Allow <math>(0, -1)</math> if marked on the <math>x</math>-axis.  Marked in the correct place, but <math>1</math>, is B0.  <math>(2, 0)</math> and <math>(0, 2)</math> can be <math>2</math> on axes</p> <p>(ii)  Top branch in 1<sup>st</sup> quadrant with 2 intersections  Bottom branch in 3<sup>rd</sup> quadrant (ignore any intersections)</p> <p>(2 intersections therefore) <math>\underline{2}</math> (roots)</p>	<p>B1 (1)</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B1 B1 (5)</p> <p>B1ft (1) [7]</p>
<p>8. (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>\left[ \frac{dy}{dx} = \right] 3kx^2 - 2x + 1</math></p> <p>Gradient of line is <math>\frac{7}{2}</math></p> <p>When <math>x = -\frac{1}{2}</math>: <math>3k \times \left(\frac{1}{4}\right) - 2 \times \left(-\frac{1}{2}\right) + 1 = \frac{7}{2}</math></p> <p><math>\frac{3k}{4} = \frac{3}{2} \Rightarrow k = 2</math></p> <p><math>x = -\frac{1}{2} \Rightarrow y = k \times \left(-\frac{1}{8}\right) - \left(\frac{1}{4}\right) - \frac{1}{2} - 5 = -6</math></p>	<p>M1 A1 (2)</p> <p>B1</p> <p>M1</p> <p>A1 A1 (4)</p> <p>M1 A1 (2) [8]</p>

Question Number	Scheme	Marks
<p>9. (a)</p>	$f'(x) = \frac{x+9}{\sqrt{x}} = \frac{x}{\sqrt{x}} + \frac{9}{\sqrt{x}} = x^{\frac{1}{2}} + 9x^{-\frac{1}{2}}$ $f(x) = \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + 9 \frac{x^{\frac{1}{2}}}{\frac{1}{2}} (+c)$ $\frac{(9)^{\frac{3}{2}}}{\frac{3}{2}} + 9 \frac{(9)^{\frac{1}{2}}}{\frac{1}{2}} + c = 0 \Rightarrow c = \dots$ $f(x) = \frac{2}{3}x^{\frac{3}{2}} + 18x^{\frac{1}{2}} - 72$ <p>(b)</p> $f'(x) = \frac{x+9}{\sqrt{x}} = 10 \Rightarrow x+9 = 10\sqrt{x}$ $(\sqrt{x}-9)(\sqrt{x}-1) = 0 \Rightarrow \sqrt{x} = \dots$ $x = 81, x = 1$	<p>M1 A1</p> <p>M1 A1</p> <p>M1</p> <p>A1</p> <p>(6)</p> <p>M1</p> <p>dM1</p> <p>A1, B1</p> <p>(4)</p> <p>[10]</p>
<p>10. (a)</p>	$\left(\frac{dy}{dx} = \right) -4 + 8x^{-2} \quad (4 \text{ or } 8x^{-2} \text{ for M1... sign can be wrong})$ $x = 2 \Rightarrow m = -4 + 2 = -2$ $y = 9 - 8 - \frac{8}{2} = -3$ <p>The first 4 marks <u>could</u> be earned in part (b)</p> <p>Equation of tangent is: <math>y + 3 = -2(x - 2) \rightarrow y = 1 - 2x</math> (*)</p> <p>(b) Gradient of normal = <math>\frac{1}{2}</math></p> <p>Equation is: <math>\frac{y+3}{x-2} = \frac{1}{2}</math> or better equivalent, e.g. <math>y = \frac{1}{2}x - 4</math></p> <p>(c) (A:) <math>\frac{1}{2}</math>, (B:) 8</p> <p>Area of triangle is: <math>\frac{1}{2}(x_B \pm x_A) \times y_P</math></p> <p>with values for all of <math>x_B, x_A</math> and <math>y_P</math></p> $\frac{1}{2}\left(8 - \frac{1}{2}\right) \times 3 = \frac{45}{4} \text{ or } 11.25$	<p>M1A1</p> <p>M1</p> <p>B1</p> <p>The first 4 marks <u>could</u> be earned in part (b)</p> <p>M1</p> <p>A1 cso</p> <p>(6)</p> <p>B1ft</p> <p>M1A1</p> <p>(3)</p> <p>B1, B1</p> <p>M1</p> <p>A1</p> <p>(4)</p> <p>[13]</p>

## Statistics for C1 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		97	3.88	3.97	3.98	3.91	3.93	3.92	3.98	3.46
2	3		66	1.99		2.76	2.37	2.15	2.01	1.81	1.41
3	6		69	4.13	5.81	5.47	4.77	4.27	3.73	3.26	2.33
4	8		62	4.98		7.16	6.22	5.28	4.38	3.42	1.96
5	9		80	7.24	8.66	8.17	7.18	6.89	6.47	5.99	4.37
6	7		64	4.50		6.56	5.50	4.53	3.78	3.13	1.73
7	7		60	4.19		6.29	5.19	4.42	3.74	3.10	2.09
8	8		57	4.58		7.22	5.72	4.44	3.36	2.64	1.65
9	10		70	7.01	9.67	8.82	7.25	5.94	5.23	4.16	1.87
10	13		53	6.87		12.10	10.04	7.86	5.14	3.56	1.35
	<b>75</b>		<b>66</b>	<b>49.37</b>		<b>68.53</b>	<b>58.15</b>	<b>49.71</b>	<b>41.76</b>	<b>35.05</b>	<b>22.22</b>