

7(a)	Substitute $x = -2$, equate to zero and attempt solution
	Obtain $32 - 8k + 4k - 34 + 18 = 0$ or equivalent and hence $k = 4$
7(b)	State $\alpha = -2$
	Divide by $x + 2$ at least as far as $2x^3 + mx$
	Obtain $2x^3 + 4x + 9$
	Rearrange $2x^3 + 4x + 9 = 0$ to confirm $x = \sqrt[3]{-2x - 4.5}$
7(c)	Consider sign of $x - \sqrt[3]{-2x - 4.5}$ or equivalent for -1.4 and -1.0
	Obtain $-0.2\ldots$ and $0.3\ldots$ or equivalents and justify conclusion
7(d)	Use iterative process correctly at least once
	Obtain final answer -1.26
	Show sufficient iterations to 5 sf to justify answer or show sign change in interval $[-1.265, -1.255]$

6(a)	Integrate to obtain expression of form $k_1 e^{2x} + k_2 e^{-x}$
	Obtain correct $\frac{1}{4} e^{2x} - \frac{1}{4} e^{-x}$
	Apply limits and arrange at least as far as $\frac{1}{2} e^{2a} = \dots$ or $e^{2a} = \dots$
	Confirm $a = \frac{1}{2} \ln(10 + \frac{1}{2} e^{-a} + \frac{1}{2} e^{-4a})$
6(b)	Consider sign of $a - \frac{1}{2} \ln(10 + \frac{1}{2} e^{-a} + \frac{1}{2} e^{-4a})$ or equivalent for values 1.0 and 1.2
	Obtain $-0.16\ldots$ and $0.041\ldots$ or equivalents and justify conclusion
6(c)	Use iteration process correctly at least once
	Obtain final answer 1.159
	Show sufficient iterations to justify answer or show a sign change in the interval $[1.1585, 1.1595]$

3(a)	Sketch decreasing positive curve for $y = 3e^{-2x}$
	Sketch curve for $y = \sec x$
3(b)	Equate and arrange at least as far as $e^{-2x} = \dots$ or $e^{2x} = \dots$ with $\cos x$ present
	Confirm $x = \frac{1}{2} \ln(3 \cos x)$
3(c)	Use iterative process correctly at least once
	Obtain final answer 0.487
	Show sufficient iterations to justify answer, or show a sign change in the interval $[0.4865, 0.4875]$

4(a)	State $4e^{-2x} = 1 + 0.5 \sin 3x$ and confirm $x = -0.5 \ln(0.25 + 0.125 \sin 3x)$
4(b)	Use iterative process correctly at least once
	Obtain final answer 0.4912
	Show sufficient iterations to 6 significant figures to justify answer or show a sign change in the interval $[0.49115, 0.49125]$
4(c)	Integrate to obtain the form $k_1 e^{-2x} + k_2 x + k_3 \cos 3x$
	Obtain correct $-2e^{-2x} - x + \frac{1}{6} \cos 3x$
	Apply limits 0 and <i>their</i> part (b) answer correctly and attempt evaluation
	Obtain 0.61