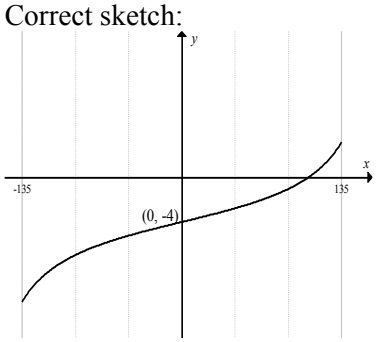
Question	Answer	Marks	Partial Marks
5(a)	$\frac{\sqrt{128}}{\sqrt{72}}=\frac{\sqrt{64\times2}}{\sqrt{36\times2}}$ or simplifies $\sqrt{\frac{128}{72}}$ to $\sqrt{\frac{16}{9}}$	**M1**	
	correct completion to $\frac{4}{3}$	**A1**	
5(b)	$\frac{3+2\sqrt{3}-\sqrt{3}\left(1+\sqrt{3}\right)}{\left(1+\sqrt{3}\right)\left(3+2\sqrt{3}\right)}$	**M1**	
	$\frac{\sqrt{3}}{3+2\sqrt{3}+3\sqrt{3}+6}$	**M1**	
	$\frac{\sqrt{3}}{9+5\sqrt{3}}\times\frac{9-5\sqrt{3}}{9-5\sqrt{3}}$	**M1**	
	$\frac{9\sqrt{3}-15}{6}$ or equivalent	**A1**	
			Alternative method **M1** for $\frac{1-\sqrt{3}}{(1+\sqrt{3})(1-\sqrt{3})}-\frac{\sqrt{3}(3-2\sqrt{3})}{(3+2\sqrt{3})(3-2\sqrt{3})}$
			M1 for $\frac{1-\sqrt{3}}{1-3}-\frac{3\sqrt{3}-6}{9-12}$
			M1 for writing with a common denominator
			A1 for $\frac{9\sqrt{3}-15}{6}$ or equivalent
6(a)	$a=20$ $b=2$ $c=-3$	**B3**	**B1** for each
6(b)	Correct sketch: 	**B2**	**B1** for correct tan shape with one continuous section only **B1** for correct y-intercept (0, –4)

Question	Answer	Marks	Partial Marks
7(a)	$\ln y = \ln(Ax^n)$ and so $\ln y = \ln A + \ln x^n$	**M1**	
	$\ln y = \ln A + n \ln x$	**A1**	
7(b)	$\ln A = 0.5$	**M1**	
	$A = e^{0.5}$ or 1.6	**A1**	
	$n = \dfrac{1.7 - 0.5}{3.2 - 0}$	**M1**	
	$n = \dfrac{3}{8}$ oe	**A1**	
7(c)	$y = their\, e^{0.5} (11)^{their \frac{3}{8}}$ oe	**M1**	
	4.05 or 4.05200... rot to four or more figs	**A1**	
8(a)	$\sec^2(x+4) - 3\cos x$	**B2**	**B1** for each
8(b)	$\dfrac{d(\ln(2x+5))}{dx} = \dfrac{2}{2x+5}$	**B1**	
	$\dfrac{d(2e^{3x})}{dx} = 6e^{3x}$	**B1**	
	$\dfrac{dy}{dx} =$ $\dfrac{2e^{3x}\left(their \dfrac{2}{2x+5}\right) - their 6e^{3x} \ln(2x+5)}{4e^{6x}}$	**M1**	**FT** *their* derivatives of $\ln(2x+5)$ and $2e^{3x}$
	$\dfrac{dy}{dx} =$ $\dfrac{2e^{3x}\left(\dfrac{2}{2x+5}\right) - 6e^{3x} \ln(2x+5)}{4e^{6x}}$	**A1**	
	$\delta y = their \left.\dfrac{dy}{dx}\right\|_{x=1} \times h$	**M1**	
	$-0.138h$	**A1**	
9(a)	–540	**B2**	**B1** for $\dfrac{6\times5\times4}{3!}(3x)^3\left(-\dfrac{1}{x}\right)^3$ oe