Question	Answer	Marks	Guidance
4(b)	Writes as a quadratic in e^{2y+1} or states $u = e^{2y+1}$ and writes as a quadratic in u oe, soi	**M1**	condone one error
	$(e^{2y+1})^2 - e^{2y+1} - 6 \quad [=0]$ oe or $u^2 - u - 6 \quad [=0]$ oe	**A1**	
	$(e^{2y+1} + 2)(e^{2y+1} - 3) \quad [=0]$ leading to $e^{2y+1} = 3$ or $(u + 2)(u - 3)$ [=0] leading to $e^{2y+1} = 3$	**A1**	
	$y = 0.0493$ and no other solutions	**A1**	
5(a)	$\frac{dy}{dx} = -(\cos 2x)^{-2} \times -2\sin 2x = \frac{2\sin 2x}{\cos^2 2x}$ or $\frac{dy}{dx} = \frac{0[\cos 2x] - (-2\sin 2x)}{\cos^2 2x} = \frac{2\sin 2x}{\cos^2 2x}$	**B2**	**B1** for $-(\cos 2x)^{-2} \times m\sin 2x$ or $\frac{0[\cos 2x] - (m\sin 2x)}{\cos^2 2x}$ where $m = 2$ or $m < 0$
5(b)	$2\tan^2 2x = 5$ or $7\cos^2 2x = 2$ or $7\sin^2 2x = 5$	**M1**	**FT** *their k*
	$\tan 2x = [\pm]\sqrt{\frac{5}{2}}$ or $\cos 2x = [\pm]\sqrt{\frac{2}{7}}$ or $\sin 2x = [\pm]\sqrt{\frac{5}{7}}$	**A1**	
	0.503 or 0.5034[26…] rot to 4 or more sf 1.07 or 1.067[36…] rot to 4 or more sf and no extras in range	**A2**	**A1** for either, ignoring extras
6(a)	$3\left(x + \frac{5}{2}\right)^2 - \frac{155}{4}$	**B4**	**B2** for $3\left(x + \frac{5}{2}\right)^2$ or $3(x + 2.5)^2$ or **B1** for $\left(x + \frac{5}{2}\right)^2$ or $(x + 2.5)^2$ **B2** for $c = -\frac{155}{4}$ or -38.75 or **B1** for $-\frac{25}{4} \times 3 - 20$ oe
6(b)	Min value $-\frac{155}{4}$ when x is $-\frac{5}{2}$	**B2**	**FT** *their c* from part **a** and **–***their b* from **(a)** **B1** for either without contradiction