Question	Answer	Marks	Guidance
7(b)	$\frac{AC}{\frac{\sqrt{6}+\sqrt{2}}{4}} = \frac{\sqrt{2}}{\frac{\sqrt{2}}{2}}$ or $\frac{AC}{\frac{\sqrt{6}+\sqrt{2}}{4}} = \frac{\sqrt{3}}{\frac{\sqrt{3}}{2}}$ or better	**M1**	
	$\frac{\sqrt{6}+\sqrt{2}}{2}$ nfww	**A1**	
8(a)	$\frac{\sin x}{\frac{\sin x}{\cos x}-1} - \frac{\cos x}{\frac{\sin x}{\cos x}+1}$	**M1**	OR $\frac{\sin x(\tan x+1)-\cos x(\tan x-1)}{(\tan x-1)(\tan x+1)}$
	$\frac{\frac{\sin x}{\sin x-\cos x}}{\cos x} - \frac{\frac{\cos x}{\sin x+\cos x}}{\cos x}$ OR $\frac{\sin x\left(\frac{\sin x}{\cos x}+1\right)-\cos x\left(\frac{\sin x}{\cos x}-1\right)}{\frac{\sin^2 x}{\cos^2 x}-1}$	**A1**	OR $\frac{\sin x\tan x+\sin x-\cos x\tan x+\cos x}{(\tan x-1)(\tan x+1)}$ OR $\frac{\sin x\left(\frac{\sin x}{\cos x}+1\right)-\cos x\left(\frac{\sin x}{\cos x}-1\right)}{\left(\frac{\sin x}{\cos x}-1\right)\left(\frac{\sin x}{\cos x}+1\right)}$
	$\frac{\sin x\cos x}{\sin x-\cos x} - \frac{\cos^2 x}{\sin x+\cos x}$ OR $\frac{\sin x\left(\frac{\sin x+\cos x}{\cos x}\right)-\cos x\left(\frac{\sin x-\cos x}{\cos x}\right)}{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}$	**A1**	OR $\frac{\frac{\sin^2 x}{\cos x}+\sin x-\sin x+\cos x}{\frac{\sin^2 x}{\cos^2 x}-1}$
	$\frac{\sin^2 x\cos x+\sin x\cos^2 x-\cos^2 x\sin x+\cos^3 x}{\sin^2 x+\cos x\sin x-\cos x\sin x-\cos^2 x}$ OR $\frac{\sin^2 x+\sin x\cos x-\cos x\sin x+\cos^2 x}{\cos x}\times\frac{\cos^2 x}{\sin^2 x-\cos^2 x}$	**A1**	OR $\frac{\frac{\sin^2 x+\cos^2 x}{\cos x}}{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}$ or $\frac{\frac{\sin^2 x+\cos^2 x}{\cos x}}{\frac{1-2\cos^2 x}{\cos^2 x}}$
	Fully correct justification of given answer e.g. $\frac{\cos x\left(\sin^2 x+\cos^2 x\right)}{\sin^2 x-\cos^2 x} = \frac{\cos x}{\sin^2 x-\cos^2 x}$ oe	**A1**	All steps correct and final step justified $\frac{1}{\cos x}\times\frac{\cos^2 x}{\sin^2 x-\cos^2 x} = \frac{\cos x}{\sin^2 x-\cos^2 x}$ oe
8(b)	$2\cos^2 x+\cos x-1[=0]$	**B2**	**B1** for $\cos x = 1-\cos^2 x-\cos^2 x$ or better
	$(2\cos x-1)(\cos x+1)[=0]$	**M1**	**FT** *their* 3-term quadratic in cos*x*
	$[x=]$ 60°, 300°, 180° and no extras in range	**A2**	**A1** for any two correct , ignoring extras

Question	Answer	Marks	Guidance
9(a)	Derivative of e^{2x}: $2e^{2x}$ soi	**B1**	
	$x \times 2e^{2x} + e^{2x}$ isw	**B1**	**FT** *their* $2e^{2x}$
9(b)	[When $x = 1$] $y = e^2$	**B1**	
	[gradient tangent =] *their* $\left.\frac{dy}{dx}\right\|_{x=1}$	**B1**	**FT** *their* derivative which must include at least one term in e^{2x}
	Gradient of normal = $\frac{-1}{\textit{their}(3e^2)}$	**B1**	**FT** $\frac{-1}{\textit{their}\left.\frac{dy}{dx}\right\|_{x=1}}$
	$y - e^2 = \frac{-1}{3e^2}(x - 1)$ oe, isw	**B1**	**dep** on 2 marks awarded in part (a) and all previous marks awarded in this part
9(c)	$\left[xe^{2x} - \frac{1}{2}e^{2x}\right]_0^2$	**M3**	**M2** for $xe^{2x} + ke^{2x}$ where $k < 0$ or $k = \frac{1}{2}$ or **M1** for $\int 2xe^{2x}dx = xe^{2x} - \int e^{2x}dx$
	$\left(2e^4 - \frac{1}{2}e^4\right) - \left(-\frac{1}{2}\right)$	**A1**	
	$1.5e^4 + 0.5$ or exact equivalent	**A1**	
10(a)	$a + 4d = 11$ oe	**B1**	
	$a + 6d = 3(a + d)$ oe	**B1**	
	Correctly eliminates one unknown and solves for a or d	**M1**	**FT** *their* linear equations in a and d providing **B1** earned.
	$d = 2,\ a = 3$	**A1**	