Question	Answer	Marks	Guidance
10(a)	Writes cot$x$ and tan$x$ in terms of sin$x$ and cos$x$: $\frac{\sin x}{1-\frac{\cos x}{\sin x}}+\frac{\cos x}{1-\frac{\sin x}{\cos x}}$	**M1**	OR $\frac{\sin x\left(1-\frac{\sin x}{\cos x}\right)+\cos x\left(1-\frac{\cos x}{\sin x}\right)}{\left(1-\frac{\cos x}{\sin x}\right)\left(1-\frac{\sin x}{\cos x}\right)}$
	Simplifies denominator: $\frac{\sin x}{\frac{\sin x-\cos x}{\sin x}}+\frac{\cos x}{\frac{\cos x-\sin x}{\cos x}}$	**A1**	OR $\frac{\sin x\left(\frac{\cos x-\sin x}{\cos x}\right)+\cos x\left(\frac{\sin x-\cos x}{\sin x}\right)}{\left(\frac{\sin x-\cos x}{\sin x}\right)\left(\frac{\cos x-\sin x}{\cos x}\right)}$
	Writes as two simple algebraic fractions: $\frac{\sin^2 x}{\sin x-\cos x}+\frac{\cos^2 x}{\cos x-\sin x}$	**A1**	OR writes as a single simple algebraic fraction: $\frac{\sin^2 x(\cos x-\sin x)+\cos^2 x(\sin x-\cos x)}{(\sin x-\cos x)(\cos x-\sin x)}$
	Writes as a difference with a common denominator: $\frac{\sin^2 x}{\sin x-\cos x}-\frac{\cos^2 x}{\sin x-\cos x}$	**A1**	OR $\frac{\sin^2 x(\cos x-\sin x)-\cos^2 x(\cos x-\sin x)}{(\sin x-\cos x)(\cos x-\sin x)}$
	Correct simplification to given answer, e.g., $\frac{(\sin x-\cos x)(\sin x+\cos x)}{(\sin x-\cos x)}=\sin x+\cos x$ or $\frac{\cancel{(\sin x-\cos x)}(\sin x+\cos x)}{\cancel{(\sin x-\cos x)}}\left[=\sin x+\cos x\right]$	**A1**	All steps correct and final step fully justified by factorising

Question	Answer	Marks	Guidance
10(b)	$10\cos^2 x + 3\cos x - 1 [= 0]$ or $\sec^2 x - 3\sec x - 10 [= 0]$	**B2**	**B1** for $\frac{9\cos x}{\sin x} + \frac{3}{\sin x} = \frac{\sin x}{\cos x}$ or better or $9 + \frac{3\tan x}{\sin x} = \tan^2 x$ or better OR **M1** for one sign error in $10\cos^2 x + 3\cos x - 1 [= 0]$ or $\sec^2 x - 3\sec x - 10 [= 0]$
	$(5\cos x - 1)(2\cos x + 1)[= 0]$ or $(\sec x - 5)(\sec x + 2)[= 0]$	**M1**	**FT** *their* 3-term quadratic in cos*x* or sec*x*
	[cos$x = \frac{1}{5}$ **and** cos$x = -\frac{1}{2}$ OR sec$x = 5$ **and** sec$x = -2$ leading to] 78.5 or 78.46[30…] rot to 2 or more dp 281.5 or 281.53[69…] rot to 2 or more dp 120 240 and no extras in range $0 < x < 360$	**A2**	**A1** for any two correct angles [found using cos$x = \frac{1}{5}$ **and** cos$x = -\frac{1}{2}$ OR sec$x = 5$ **and** sec$x = -2$]; ignore extras