Q	Marking instructions	AO	Mark	Typical solution
6	Compares with $R\cos(x\pm\alpha)$ or $R\sin(x\pm\alpha)$ by forming an identity e.g. $R\sin(x+\alpha)\equiv a\sin x+b\cos x$ **OE** or Differentiates correctly and equates to zero **CAO PI** by $a\cos x=b\sin x$ **PI** by R = 4 or $a^2+b^2=16$	3.1a	M1	$R\sin(x+\alpha)=a\sin x+b\cos x$ $R=4$ $4\sin\left(\frac{\pi}{3}+\alpha\right)=2\sqrt{3}$ $\alpha=\frac{\pi}{3}$ $a=4\cos\frac{\pi}{3}=2$ $b=4\sin\frac{\pi}{3}=2\sqrt{3}$
	Deduces R = 4 or $a^2+b^2=16$	2.2a	A1	
	Forms a correct equation for α **PI** by correct α or Forms the equation shown below $2\sqrt{3}=\frac{a\sqrt{3}}{2}+\frac{b}{2}$ **OE** **Must** substitute correct exact values for the trig functions	1.1b	B1	
	Solves their equation to obtain any correct value of α Correct values are shown below $\alpha=\frac{\pi}{3}$ or 0 for $R\sin(x\pm\alpha)$ $\alpha=\pm\frac{\pi}{6}$ for $R\cos(x\pm\alpha)$ or Eliminates a variable correctly from their two equations – **must** obtain a correct simplified equation	1.1a	M1	
	Deduces $a=2$	2.2a	R1	
	Deduces $b=2\sqrt{3}$	2.2a	R1	
	Total		**6**	