Question Number	Scheme	Marks
5 (a)	$\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta \Rightarrow \alpha\beta=\frac{5^2-19}{2}=3$ cso ***	M1A1cso (2)
(b)	$\Rightarrow \frac{c}{a}=3$ and $-\frac{b}{a}=5$ let $a=1 \Rightarrow x^2-5x+3=0$ oe	M1A1 (2)
(c)	$\frac{\beta}{\alpha}+\frac{\alpha}{\beta}=\frac{\alpha^2+\beta^2}{\alpha\beta}$, $=\frac{19}{3}$	M1,A1
	$\frac{\beta}{\alpha}\times\frac{\alpha}{\beta}=1$	B1
	$x^2-\frac{19}{3}x+1\ (=0)$, $3x^2-19x+3=0$ oe	M1,A1 (5) **(9)**
(a)M1	Obtain an expression for $\alpha\beta$ in terms of $\alpha+\beta$ and $\alpha^2+\beta^2$	
A1cso	Correct value for $\alpha\beta$	
ALT:	Solve the given equations for α and β M1 Fully correct to given answer A1	
(b)M1	Use $x^2-(\text{sum of roots})x+\text{product of roots}\ (=0)$	
A1	A correct **equation -** any integer multiple of the one shown	
(c)M1	Write the sum of the roots as a single fraction. Algebra to be correct for this mark.	
A1	Correct value for the sum of the roots	
B1	Product = 1 Seen explicitly or used	
M1	Use $x^2-(\text{sum of roots})x+\text{product of roots}\ (=0)$	
A1ft	Correct equation. Follow through their sum and product. Any integer multiple accepted.	
6 (a)	$\sin(2x)=\sin x\cos x+\cos x\sin x=2\sin x\cos x$ *	B1
(b)	$\cos(2x)=\cos x\cos x-\sin x\sin x=\cos^2 x-\sin^2 x$ *	B1 (2)
(c)	$\frac{\sin 2x}{1+\cos 2x}=\frac{2\sin x\cos x}{1+(\cos^2 x-\sin^2 x)}$	M1
	$=\frac{2\sin x\cos x}{\cos^2 x+\sin^2 x+\cos^2 x-\sin^2 x}$	dM1A1
	$=\frac{2\sin x\cos x}{2\cos^2 x}=\tan x$ ***	A1cso (4) **(6)**
(a)B1	For the correct result. Award only if evidence of use of the given formula is seen	
(b)B1	As for (a)	
(c)M1	Use the above identities to change "2x"s to "x"s	
dM1	Use $\cos^2 x+\sin^2 x=1$ to eliminate $\sin^2 x$ Min evidence is $(1-\sin^2 x)$ changed to $\cos^2 x$ or $(1-\sin^2 x)+\cos^2 x=2\cos^2 x$ Denominator 1 + c^2 - s^2 changed to either c^2+c^2 or $2c^2$ is NOT sufficient But 1 - s^2 + c^2 changed to c^2 + c^2 or $2c^2$ is sufficient	
A1	Correct (unsimplified) fraction, as shown or equivalent (no trig functions of 2x) **Both** M marks must be gained for this A mark to be awarded	
A1cso	Obtain the GIVEN result with no errors seen	