Q	Marking instructions	AO	Mark	Typical solution
8(a)	Recalls and uses $\sin 2\theta = 2\sin\theta\cos\theta$	1.2	B1	$9\sin^2\theta+\sin2\theta=8$ $9\sin^2\theta + 2\sin\theta\cos\theta = 8$ $9 + 2\cot\theta = 8\operatorname{cosec}^2\theta$ $9+2\cot\theta = 8\left(\cot^2\theta+1\right)$ $8\cot^2\theta - 2\cot\theta - 1 = 0$
	Uses $\cot^2\theta+1=\operatorname{cosec}^2\theta$ Or $\tan^2\theta+1=\sec^2\theta$ Condone a sign error	1.1a	M1	
	Divides through by $\cos^2\theta$ or $\sin^2\theta$	1.1a	M1	
	Completes rearrangement to achieve given result. **AG**	2.1	R1	
	Subtotal		**4**	

Q	Marking instructions	AO	Mark	Typical solution
8(b)	Solves to give values of cot θ or tan θ PI by sight of 2 and – 4 or $-\frac{1}{4}$ and $\frac{1}{2}$ or by two correct answers	1.1a	M1	$\cot\theta = -\frac{1}{4}$ or $\cot\theta = \frac{1}{2}$ tan θ = – 4 or tan θ = 2 θ = 1.82 θ = 1.82 + π = 4.96 θ = 1.11 θ = 1.11 + π = 4.25
	Obtains two correct values of θ. Condone AWRT correct answers.	1.1b	A1	θ = 1.11, 1.82, 4.25, 4.96
	Obtains all four solutions with no additional solutions or errors. Ignore additional solutions outside the interval. AWRT 1.11, 1.82, 4.25, 4.96 CAO	1.1b	A1	
	Subtotal		**3**	

Q	Marking instructions	AO	Mark	Typical solution
8(c)	Sets $2x-\frac{\pi}{4}$ equal to at least one of their solutions. PI by a correct answer	3.1a	M1	$2x-\frac{\pi}{4}=1.107..,1.815..$ x = 0.9, 1.3
	Obtains correct AWRT values. Correct values should be rounded from 0.94627… and 1.300058… ISW once correct answers seen. CSO Condone extra values outside of the interval.	1.1b	A1	
	Subtotal		**2**	

	Question Total		**9**	