Question	Scheme	Marks	AOs
9(a)	$5\cos\theta = 24\tan\theta$		
	Attempts to use both $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$ and $\sin^2\theta + \cos^2\theta = 1$ and arrives at a quadratic equation in $\sin\theta$	M1	3.1a
	$5\cos\theta = 24\tan\theta \Rightarrow 5\cos^2\theta = 24\sin\theta$	B1	1.1b
	$5(1-\sin^2\theta) = 24\sin\theta \Rightarrow 5 - 5\sin^2\theta = 24\sin\theta$	M1	1.1b
	Arrives at $5\sin^2\theta + 24\sin\theta - 5 = 0$ with no errors. *	A1*	2.1
		(4)	
(b)	$(5\sin x - 1)(\sin x + 5) = 0 \Rightarrow \sin x = ... \Rightarrow x = ...$	M1	1.1b
	Any one of $x = 11.5°, 168.5°, 371.5°, 528.5°$	A1	1.1b
	$x = 11.5°, 168.5°, 371.5°, 528.5°$ only	A1	2.2a
		(3)	
(c)	Deduces that there are 8 times as many solutions in the interval. $8 \times "4" = 32$	B1ft	2.2a
		(1)	

(8 marks)

Notes:

(a)

M1: An overall problem-solving mark, condoning slips, for an attempt to

- Use $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$
- Use $\pm\sin^2\theta \pm \cos^2\theta = \pm 1$
- Arrive at a quadratic equation in $\sin\theta$

B1: Uses the correct identity and multiplies across to give $5\cos\theta = 24\tan\theta \Rightarrow 5\cos^2\theta = 24\sin\theta$

M1: Uses the correct identity $\sin^2\theta + \cos^2\theta = 1$ to form a quadratic in $\sin\theta$

A1*: Arrives at the given answer $5\sin^2\theta + 24\sin\theta - 5 = 0$ with no errors.

(b)

M1: Attempts to solve the given quadratic in $\sin x$ using an appropriate method (it is acceptable to use a calculator to solve this) and proceeds to at least one value of x

A1: At least one correct value of x

A1: $x = 11.5°, 168.5°, 371.5°, 528.5°$ only in the given interval. Ignore solutions outside the interval. Do not penalise missing degree symbols.

(c)

B1ft: $8\times$ their number of solutions to part (b). Allow a restart – so 32 is accepted regardless of their answer in (b).