Question	Scheme	Marks	AOs
8 (a)	**(a)** $P=(210,-5)$	B1 B1	1.1b 1.1b
		(2)	
(b)	$5\cos(x-30°)=4\sin x$		
	Uses the compound angle identity and attempts to collect terms $5\cos x\cos 30°+5\sin x\sin 30°=4\sin x$ $5\cos x\cos 30°=\sin x(4-5\sin 30°)$	M1	2.1
	Uses $\frac{\sin x}{\cos x}=\tan x$ $\tan x=\frac{5\cos 30°}{4-5\sin 30°}=\frac{5\sqrt{3}}{3}$ or awrt 2.89	M1 A1	2.1 1.1b
	$x=70.9, 250.9$	A1	1.1b
		(4)	
(c)	Deduces the number of roots = 40	B1ft	2.2a
	Offers a correct explanation. Eg States that there are **10** cycles of $360°$ and $x\to 2x$ will mean that there are 4 roots between 0 and $360°$ (not 2)	B1	2.4
		(2)	
			(8 marks)

Notes:

(a)

B1: For one correct coordinate. Either $P=(\ldots,-5)$ or $P=(210,\ldots)$ but allow $P=(210°,\ldots)$

B1: For $P=(210,-5)$ but allow $P=(210°,-5)$

(b)

M1: Attempts to use the identity $5\cos(x-30°)\equiv 5\cos x\cos 30°+5\sin x\sin 30°$ and attempts to collect terms . If the candidate divides by $\cos x$ first then it is for collecting terms in $\tan x$

M1: Divides by $\cos x$, uses the identity $\tan x=\frac{\sin x}{\cos x}$ leading to $\tan x=\ldots$

A1: $\tan x=\frac{5\sqrt{3}}{3}$ but allow $\tan x=$ awrt 2.89

A1: Both $x=70.9, 250.9$ (awrt 1dp) and no other answers. Allow $x=70.9°, 250.9°$

(c)

B1ft: Deduces that there will be 40 roots but follow through on $20\times$ the number of roots the candidate has between 0 and $360°$ in (b)

B1: Explains that $3600°$ is **10** cycles of $360°$ **and** $x\to 2x$ will **double** the number roots between 0 and $360°$