

Question	Answer	Marks	Guidance
6	[Perimeter =] $r + r\theta + r + 2r \times 2\theta + r + r\theta + r$ $[= 4r + 6r\theta]$	B1	
	[Area =] $\frac{1}{2}r^2\theta + \frac{1}{2}(2r)^2 \times 2\theta + \frac{1}{2}r^2\theta$ $[= 5r^2\theta]$	B1	
	$4r + 6r\theta = 14$ and $5r^2\theta = 10$	M1*	$ar + br\theta = 14$ and $cr^2\theta = 10$ where a , b and c are constants $\neq 0$. Terms may be uncollected.
	EITHER		
	$5r^2 \frac{14 - 4r}{6r} = 10$ or $4r + 6r\left(\frac{10}{5r^2}\right) = 14$	DM1	Eliminate θ to get an equation in r .
	$[\Rightarrow 2r^2 - 7r + 6 = 0 \Rightarrow] (r - 2)(2r - 3) = 0$	DM1	Factorise or other accepted method for solving their 3-term quadratic.
	OR		
	$5\left(\frac{14}{4 + 6\theta}\right)^2 \theta = 10$ or $4\left(\sqrt{\frac{10}{5\theta}}\right) + 6\left(\sqrt{\frac{10}{5\theta}}\right)\theta = 14$	DM1	Eliminate r to get an equation in θ .
	$[\Rightarrow 18\theta^2 - 25\theta + 8 = 0 \Rightarrow] (9\theta - 8)(2\theta - 1) = 0$	DM1	Factorise or other accepted method for solving their 3-term quadratic.
	Then		
	$r = 2$ and $\theta = 0.5$	B1	Condone extra answers $r = \frac{3}{2}$ and $\theta = \frac{8}{9}$.
		6	