

7	(a)	$\theta = \frac{72.576}{r^2} \text{ or } 72.576 r^{-2} \text{ isw}$	B1 [1]	1.1	eg $\frac{9072}{125r^2}$ or $\frac{9072r^{-2}}{125}$	
7	(b)	$r\theta + 2r$ or $r(\theta + 2) = 24.48$ seen and $\theta = \frac{24.48 - 2r}{r}$ or equivalent constructive step to give $\frac{24.48}{r} - 2$ AG	B1 [1]	1.1	or $2\pi r \frac{\theta}{2\pi} + 2r = 24.48$	

Question		Answer	Marks	AOs		Guidance
7	(c)	<p><i>their</i> $\frac{2 \times 36.288}{r^2} = \frac{24.48}{r} - 2$ oe</p> <p>$r^2 - 12.24r + 36.288 [= 0]$</p> <p>$[r =] 5.04$ or 7.2 oe</p>	<p>M1</p> <p>M1</p> <p>A1</p> <p>[3]</p>	<p>3.1a</p> <p>2.1</p> <p>1.1</p>	<p>NB 72.576</p> <p>quadratic obtained in form $f(r) [= 0]$</p>	<p>allow B3 for 5.04 and 7.2 unsupported</p> <p>or allow SC3 for obtaining and solving an equation for θ and then finding both values of r</p>