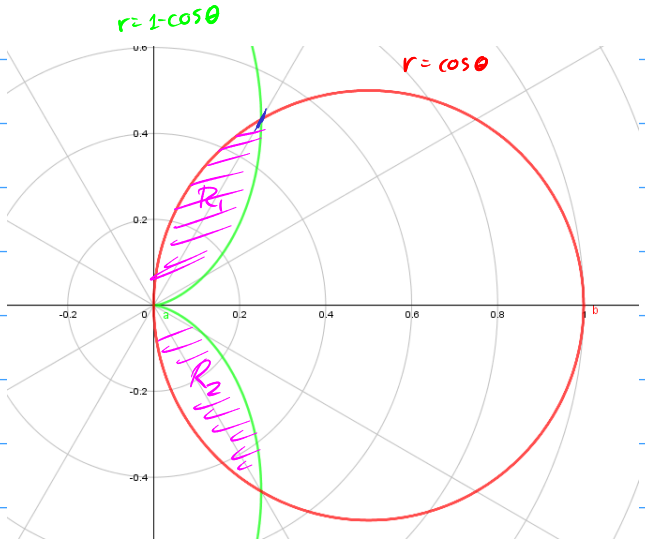
Pregunta 2



$R = R_1 + R_2$

Son Regiones iguales

calculamos el valor del angulo de interseccion

$1 - \cos\theta = \cos\theta$

$1 = 2\cos\theta$

$\frac{1}{2} = \cos\theta \Rightarrow \theta = 60° = \frac{\pi}{3}$ rad

$\Rightarrow$ el area total es 2. integral en una region

$$\Rightarrow A = 2\cdot\iint_{R_1} r\,dr\,d\theta = 2\cdot\left[\int_0^{\frac{\pi}{3}}\int_0^{1-\cos\theta} r\,dr\,d\theta + \int_{\frac{\pi}{3}}^{\frac{\pi}{2}}\int_0^{\cos\theta} r\,dr\,d\theta\right]$$

$$A = 2\cdot\left[\int_0^{\frac{\pi}{3}} \frac{r^2}{2}\Big|_0^{1-\cos\theta} d\theta + \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \frac{r^2}{2}\Big|_0^{\cos\theta} d\theta\right]$$

$$A = \cancel{2}\cdot\frac{1}{\cancel{2}}\left[\int_0^{\frac{\pi}{3}} (1-\cos\theta)^2 d\theta + \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \cos^2\theta\, d\theta\right]$$

$\cos^2\theta = \frac{1+\cos(2\theta)}{2}$

$$A = \int_0^{\frac{\pi}{3}} (1 - 2\cos\theta + \cos^2\theta)\, d\theta + \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \frac{1+\cos(2\theta)}{2}\, d\theta$$

$$A = \theta\Big|_0^{\frac{\pi}{3}} - 2\cdot\operatorname{sen}\theta\Big|_0^{\frac{\pi}{3}} + \int_0^{\frac{\pi}{3}} \frac{1+\cos(2\theta)}{2} d\theta + \frac{\theta}{2}\Big|_{\frac{\pi}{3}}^{\frac{\pi}{2}} + \frac{1}{2}\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \cos(2\theta)\, d\theta$$

$$A = \frac{\pi}{3} - \sqrt{3} + 0{,}74 + \frac{\pi}{6} + \frac{\pi}{12} + \left(\frac{-\sqrt{3}}{8}\right) = \underline{0{,}1005\ ul^2}$$