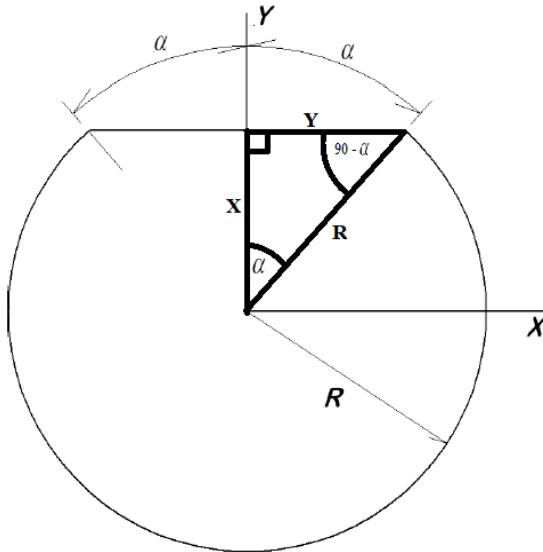


AREA OF ENCLOSED = Area of circle – Area of sectors + Area of Triangles

Area of a circle = πR^2

Area of sectors = $\frac{2 \times \alpha}{360} \times \pi R^2 = \frac{\pi \alpha R^2}{180}$

Area of Triangle



From Sine rule:

$$\frac{\sin(90)}{R} = \frac{\sin(\alpha)}{y} = \frac{\sin(90 - \alpha)}{x}$$

$$y = \frac{R \sin(\alpha)}{\sin(90)} = R \sin(\alpha)$$

$$x = \frac{R \sin(90 - \alpha)}{\sin(90)} = R \sin(90 - \alpha)$$

$$\text{Area of both triangles} = 2 \times \frac{R \sin(\alpha) \times R \sin(90 - \alpha)}{2} = R^2 \sin(\alpha) \sin(90 - \alpha)$$

$$\text{AREA OF ENCLOSED} = \pi R^2 - \frac{\pi \alpha R^2}{180} + R^2 \sin(\alpha) \sin(90 - \alpha) \quad \{ \text{note: } \sin(90 - \alpha) = \cos(\alpha) \}$$

$$= \pi R^2 - \frac{\pi \alpha R^2}{180} + R^2 \sin(\alpha) \cos \alpha$$

$$= R^2 \left[\pi - \frac{\pi \alpha}{180} + R^2 \sin(\alpha) \cos(\alpha) \right]$$