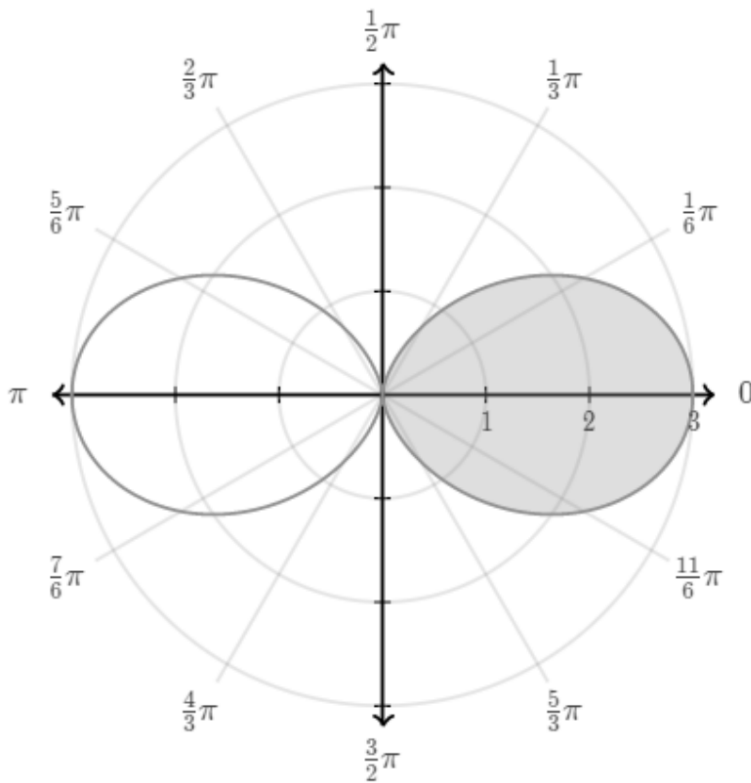


Area of a polar region:

$$A = \frac{1}{2} \int_a^b [f(\theta)]^2 d\theta$$



What is the area of the shaded region bounded by one loop of the polar curve  $r = 3\cos^2(\theta)$

$$\frac{1}{2} \int_{-\pi/2}^{\pi/2} \left( 3\cos^2(\theta) \right)^2 d\theta$$

$$\frac{9}{2} \int_{-\pi/2}^{\pi/2} \cos^4(\theta) d\theta$$

$$9 \int_0^{\pi/2} \cos^4(\theta) d\theta$$

(symmetry)

**5.3014**