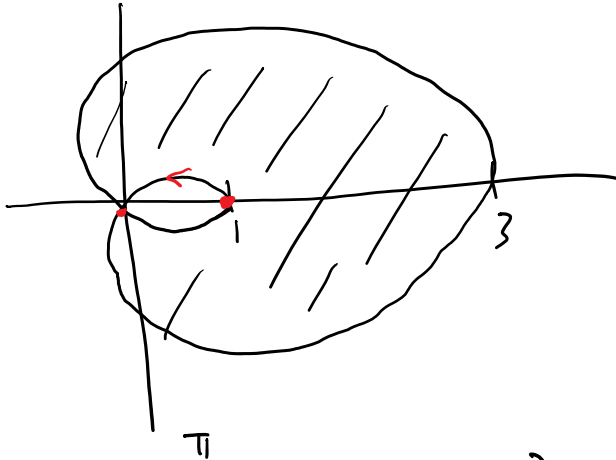


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$$r = 2 \cos \theta - 1$$

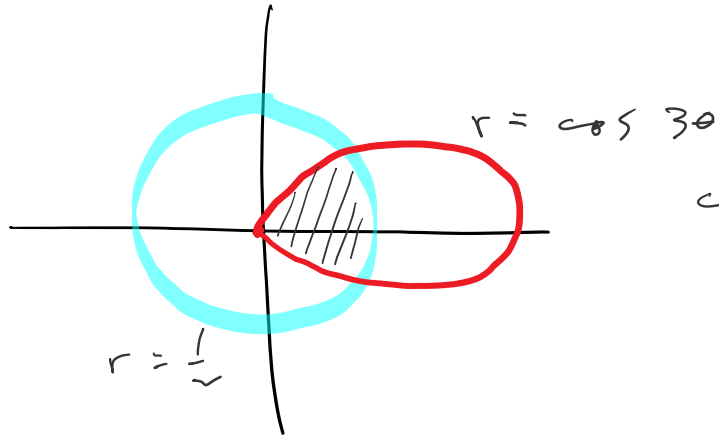


$\theta$	$r$
0	1
$\pi/3$	0
	3

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

$$= 2 \cdot \frac{1}{2} \int_0^{\pi/3} (2 \cos \theta - 1)^2 d\theta$$

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$$\begin{aligned} \cos 3\theta &= \frac{1}{2} \\ 3\theta &= \pi/3 \\ \theta &= \pi/9 \end{aligned}$$

area of petal

$$2 \cdot \frac{1}{2} \int_0^{\pi/6} \cos^2 3\theta \, d\theta$$

area inside petal + outside circle

$$2 \cdot \frac{1}{2} \int_0^{\pi/9} \cos^2 3\theta - \frac{1}{2} \, d\theta$$