

Frequently occurring polar equations:

$r = a$ circle, center at O , radius = a ; $0 \leq \theta \leq 2\pi$

$\theta = a$ line, through O , slope = $\tan a$; $-\infty < r < \infty$

$r = a \sec \theta$ vertical line $x = a$; $-\pi/2 < \theta < \pi/2$ (1st quad)

$r = a \csc \theta$ horizontal line $y = a$; $0 < \theta < \pi$ ($\theta > 0$)

$r = 2a \cos \theta$ circle, center at $(x, y) = (a, 0)$, radius = a ; $-\pi/2 \leq \theta \leq \pi/2$

$r = 2a \sin \theta$ circle, center at $(x, y) = (0, a)$, radius = a ; $0 \leq \theta \leq \pi$

$r = a + b \cos \theta$ limaçon (cardioid when $a = b$); $0 \leq \theta \leq 2\pi$

$r = a + b \sin \theta$

$r = \cos(2n\theta)$ $4n$ -petal rose; $0 \leq \theta \leq 2\pi$

$r = \cos((2n+1)\theta)$ $(2n+1)$ -petal rose; $0 \leq \theta \leq \pi$

$$r = \sin 3\theta$$

