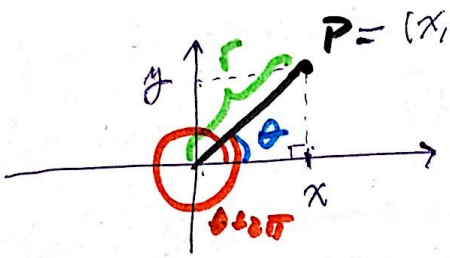
COORDENADAS POLARES

Sección 10.3 del Stewart.

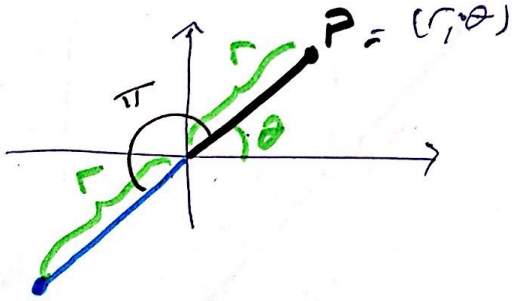


$P = (x, y) = (r ; \theta)$

$$x = r\cos\theta$$
$$y = r\operatorname{sen}\theta$$

$(r ; \theta) = (r ; \theta + 2\pi)$

$$r^2 = x^2 + y^2$$
$$\tan\theta = \frac{y}{x}$$



$(-r ; \theta) = (r ; \theta + \pi)$

$(r ; \theta) = (r ; \theta + 2k\pi) = (-r ; \theta + (2k+1)\pi)$

Si consideramos $r \geq 0$

$0 \leq \theta < 2\pi$

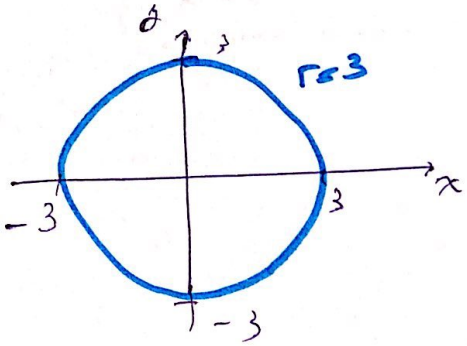
$(0 ; \theta) = (0, 0) \quad \forall \theta$

CURVAS POLARES

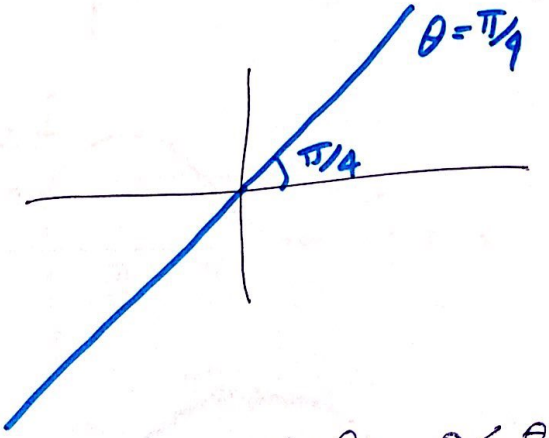
Una curva polar es aquella que se describe mediante la fórmula $r = f(\theta)$; $\theta = f(r)$ o

Con $f : \mathbb{R} \longrightarrow \mathbb{R}$. $F(r,\theta) = 0$

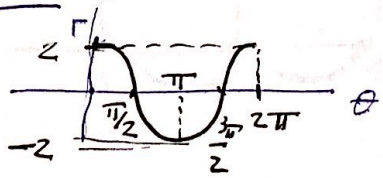
Ej $r = 3$

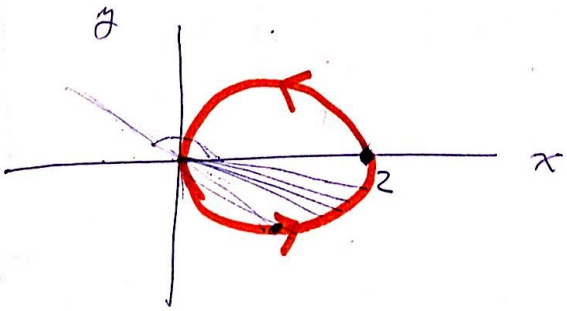


Ej $\theta = \pi/4$



Ej $r = 2\cos\theta \quad 0 \le \theta \le 2\pi$.





$r = 2\cos\theta = 2\frac{x}{r}$

$r^2 = 2x$

$x^2 + y^2 = 2x$

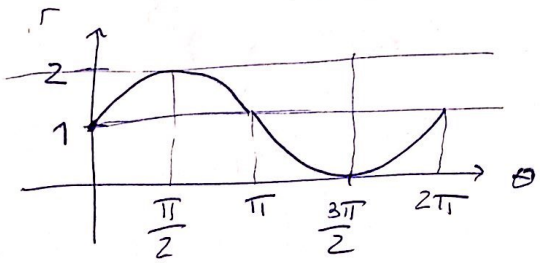
$(x^2 - 2x) + y^2 = 0$

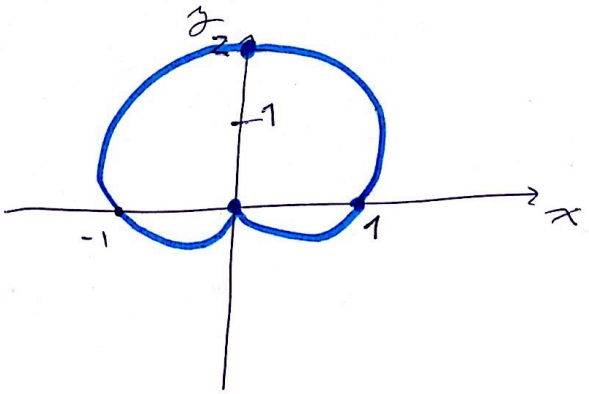
$(x^2 - 2x + 1) + y^2 - 1 = 0$

$(x-1)^2 + y^2 = 1$

Ej CARDIOIDE

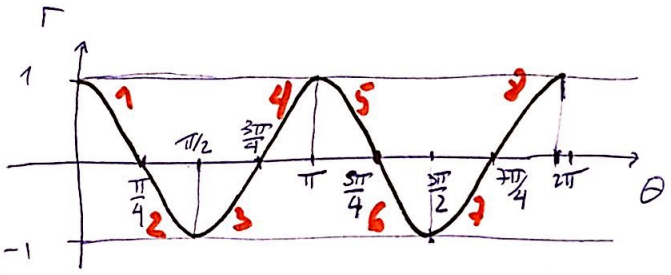
$r = 1 + \operatorname{sen}\theta \qquad 0 \le \theta \le 2\pi$

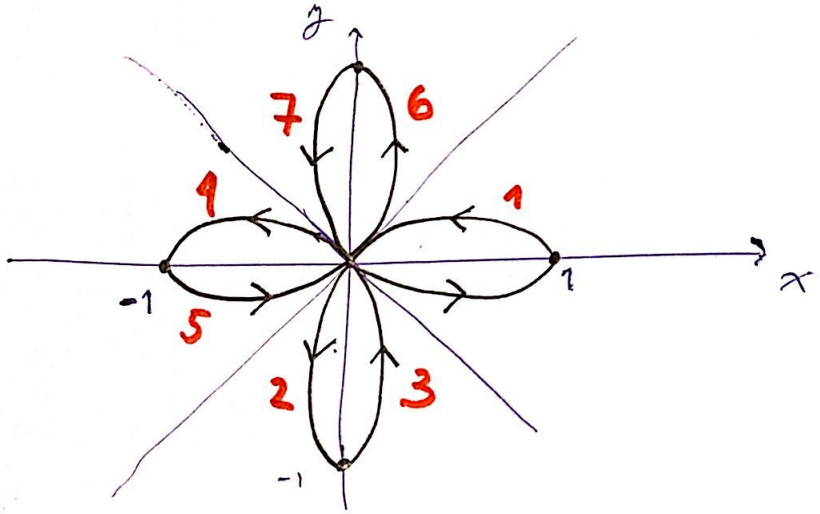




Ej Rosa de 4 pétalos

$r = \cos 2\theta \; ; \; 0 \le \theta \le 2\pi$





¿Pueden hallar la ecuación polar de una rosa de 8 pétalos?