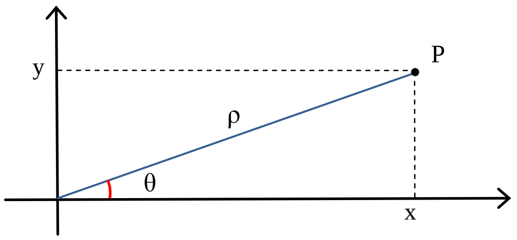
Coordinate polari ed Equazioni di curve notevoli

coordinate polari

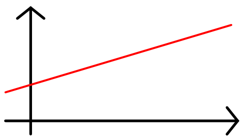
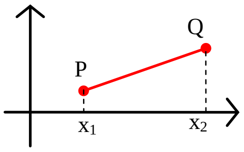
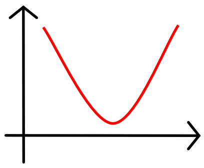
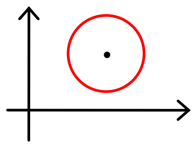
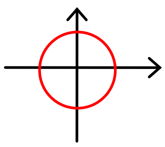
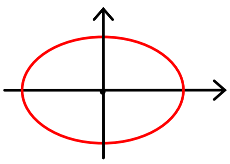
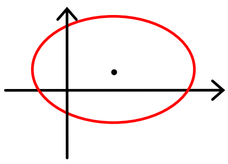


$P(x,y)$	coordinate cartesiane del punto P
$P(\rho,\theta)$	coordinate polari del punto P
$\rho = modulo$	distanza di P dall'origine
$\theta = anomalia$	misura dell'angolo orientato in senso antiorario formato da ρ con il semiasse positivo delle x

passaggio di coordinate

da cartesiane a polari	da polari a cartesiane
$P(x,y) \;\rightarrow\; \begin{cases} x = \rho\, cos\theta \\ y = \rho\, sen\theta \end{cases} \;\rightarrow\; P(\rho,\theta)$	$P(\rho,\theta) \;\rightarrow\; \begin{cases} \rho = \sqrt{x^2+y^2} \\ cos\theta = \dfrac{y}{\rho}\ ;\ sen\theta = \dfrac{x}{\rho} \end{cases} \;\rightarrow\; P(x.y)$

equazione cartesiana parametrica e polare di curve notevoli

grafico	equazione cartesiana	equazione parametrica	equazione polare
	retta $y = mx + q$	$\begin{cases} x = t \\ y = mt + q \end{cases}$ con $t \in \mathbb{R}$	$\rho(sen\theta - mcos\theta) - q = 0$
	segmento di estremi $P(x_1,y_1)$ e $Q(x_2,y_2)$ $y = mx + q$ con $x_1 < x < x_2$	$\begin{cases} x = x_1(1-t) + x_2 t \\ y = y_1(1-t) + y_2 t \end{cases}$ con $0 \le t \le 1$	$\rho(sen\theta - mcos\theta) - q = 0$ con $\rho_P \le \rho \le \rho_Q$ e $\theta_P \le \theta \le \theta_Q$
	parabola con asse parallelo all'asse y $y = ax^2 + bx + c$	$\begin{cases} x = t \\ y = at^2 + bt + c \end{cases}$ con $t \in \mathbb{R}$	$\rho(sen\theta - a\rho cos^2\theta - bcos\theta) = c$
	circonferenza di centro $C(\alpha,\beta)$ e raggio r $x^2 + y^2 + ax + by + c = 0$	$\begin{cases} x = \alpha + r\cos t \\ y = \beta + r\, sen\, t \end{cases}$ con $0 \le t \le 2\pi$	$\rho^2 + \rho(acos\theta + bsen\theta) + c = 0$
	circonferenza di centro l'origine e raggio r $x^2 + y^2 = r^2$	$\begin{cases} x = r\cos t \\ y = r\, sent \end{cases}$ con $0 \le t \le 2\pi$	$\rho = r$
	ellisse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$	$\begin{cases} x = a\cos t \\ y = b\, sen\, t \end{cases}$ con $0 \le t \le 2\pi$	$\rho^2(b^2cos^2\theta + a^2sen^2\theta) = a^2b^2$
	ellisse traslata di centro $O'(\alpha,\beta)$ $\dfrac{(x-\alpha)^2}{a^2} + \dfrac{(y-\beta)^2}{b^2} = 1$	$\begin{cases} x = x_0 + a\cos t \\ y = y_0 + b\, sen\, t \end{cases}$ con $0 \le t \le 2\pi$	$b^2(\rho\cos\theta - \alpha) + a^2(\rho sen\,\theta - \beta) = a^2b^2$