Class Discussion

Unit 9 Topic 5 Polar Coordinate System

$$\begin{cases} r = \sqrt{x^2 + y^2} \\ \theta = \arctan\left(\dfrac{y}{x}\right) \end{cases} \longleftrightarrow \begin{cases} x = r\cos\theta \\ y = r\sin\theta \end{cases}$$

If $(r;\theta)$ with $r < 0$ then $(r;\theta) = (r;\theta + \pi) = (r;\theta - \pi)$

Ex 1: Covert $(r;\theta)$ to (x, y)

(a) $(2;\dfrac{\pi}{4})$

(b) $(-3;\dfrac{\pi}{6})$

Ex 2: Convert (x, y) to $(r;\theta)$,for $0 \le \theta < 2\pi$

(a) $(-3, 4)$

(b) $(\sqrt{3}, -1)$

Ex 3: Convert a rectangular equation to a polar equation $x^2 + y^2 - 6x = 0$