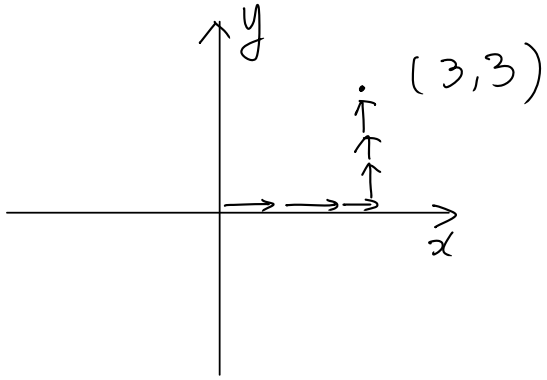
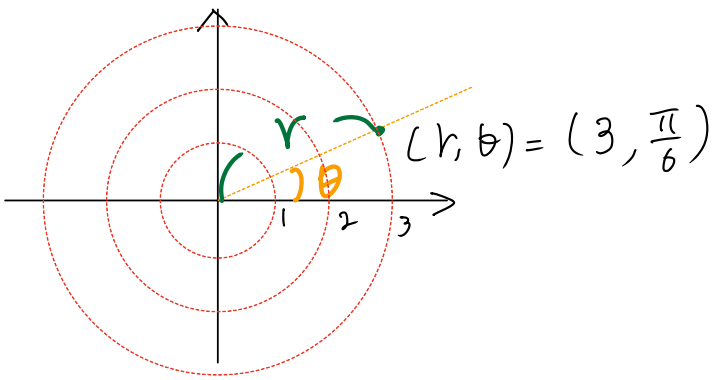
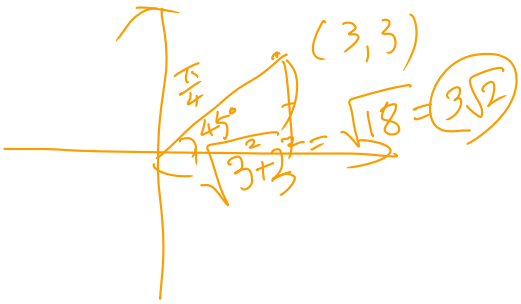
NT 1.5 Polar coordinates (2D)



We specified locations (2D) by how many steps we need to take horizontally and vertically. This way of representation is called **Cartesian coordinate** system

We can locate a position using a distance and direction, called **polar coordinate.**





Cartesian ↓

Clicker Find the polar coodinate of (3,3)

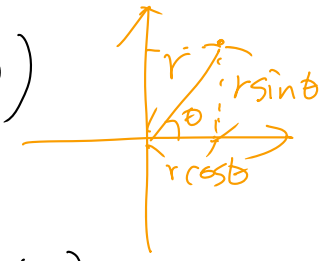
(A) $(0, \frac{\pi}{2})$ (B) $(-3, 0)$ (C) $(3, \frac{\pi}{2})$

(D) $(3\sqrt{2}, \frac{\pi}{4})$ (E) $(3\sqrt{2}, 45^\circ)$ → radian w/o "°"

In general, they are related:

Cartesian
(x, y)

Polar
(r, θ)



$x = r\cos\theta$
$y = r\sin\theta$

$\longleftarrow (r, \theta)$

$(x, y) \longrightarrow$

$r = \sqrt{x^2 + y^2}$

$\theta = \tan^{-1}\left(\frac{y}{x}\right)$ slope