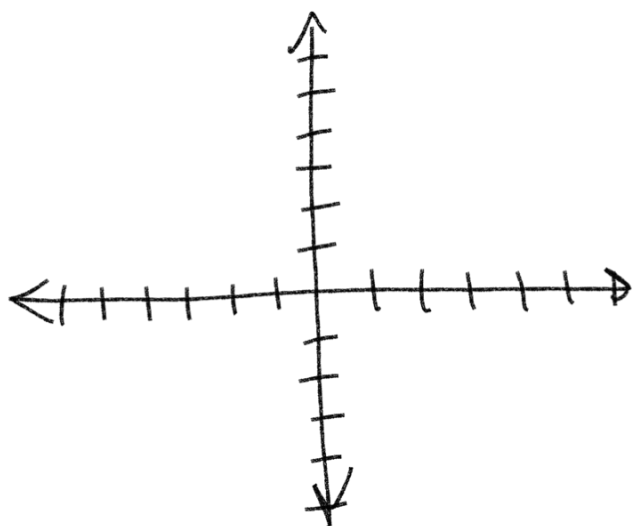
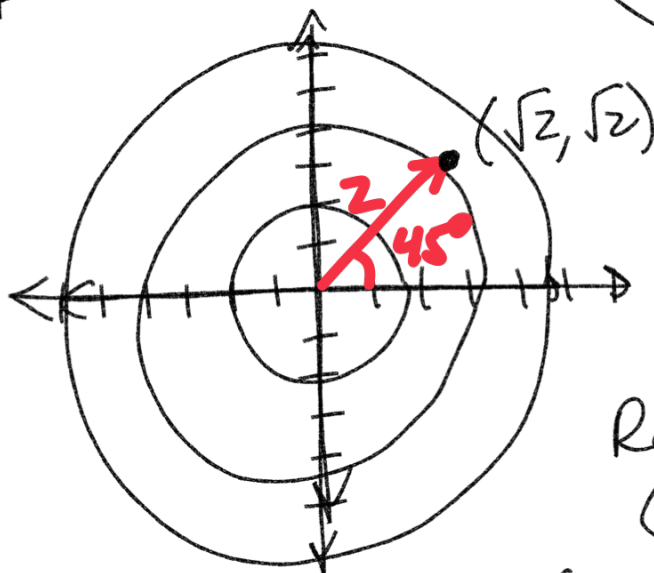
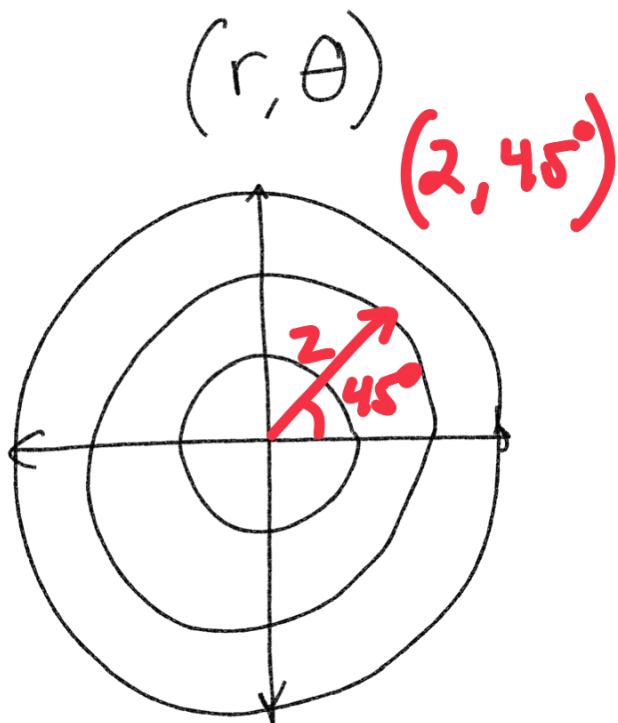


MTH-PT Trigonometry Session 26 5/1

Rectangular Coordinates
(x, y)

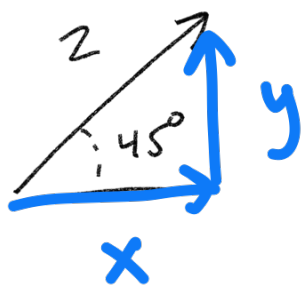


Polar Coordinates
(r, θ)



Polar Rect.
 $(2, 45^\circ) \rightarrow (\sqrt{2}, \sqrt{2})$

Rectangular
(x, y)
 $(r \cos \theta, r \sin \theta)$



$$r \cos \theta = x$$

$$r \sin \theta = y$$

$$2 \cos 45^\circ = 2 \left(\frac{\sqrt{2}}{2} \right) = \sqrt{2}$$

$$2 \sin 45^\circ = 2 \left(\frac{\sqrt{2}}{2} \right) = \sqrt{2}$$

$$(r, \theta) \quad (3, 120^\circ) \longrightarrow (x, y)$$

$$x = r \cos \theta$$

$$3(\cos 120)$$

$$3\left(-\frac{1}{2}\right)$$

$$-\frac{3}{2}$$

$$y = r \sin \theta$$

$$3 \sin 120$$

$$3\left(\frac{\sqrt{3}}{2}\right)$$

$$\frac{3\sqrt{3}}{2}$$

$$\left(-\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$$

$$(r, \theta) : \left(\frac{2}{7}, 210^\circ\right) \text{ or } \left(\frac{2}{7}, \frac{7\pi}{6}\right)$$

$$x = r \cos \theta$$

$$\frac{2}{7} \left(-\frac{\sqrt{3}}{2}\right)$$

$$-\frac{\sqrt{3}}{7}$$

$$y = r \sin \theta$$

$$\frac{2}{7} \left(-\frac{1}{2}\right)$$

$$-\frac{1}{7}$$

$$\left(-\frac{\sqrt{3}}{7}, -\frac{1}{7}\right)$$

Rectangular \longrightarrow
 (x, y) \longrightarrow

Polar
 (r, θ)

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

$$\theta = \tan^{-1} \frac{y}{x}$$

$(-2, 6)$

$$r = \sqrt{(-2)^2 + (6)^2}$$

$$\sqrt{4 + 36} = \sqrt{40}$$

$$\sqrt{4} \sqrt{10}$$

$$2\sqrt{10}$$

(r, θ)

$(2\sqrt{10}, 108.4^\circ)$

$$\theta = \tan^{-1} \frac{6}{-2}$$

$$\theta = \tan^{-1}(-3) = -71.6^\circ$$



$$180.10$$

$$-71.6$$

$$108.4^\circ$$

$(-4, -3) \longrightarrow (r, \theta)$

$$r = \sqrt{(-4)^2 + (-3)^2}$$

$$\sqrt{16 + 9} = \sqrt{25} = 5$$

$(5, 216.9^\circ)$

$$\theta = \tan^{-1} \frac{-3}{-4}$$

$$\tan^{-1} \frac{3}{4} = 36.9$$

$$+ 180$$

$$216.9^\circ$$



