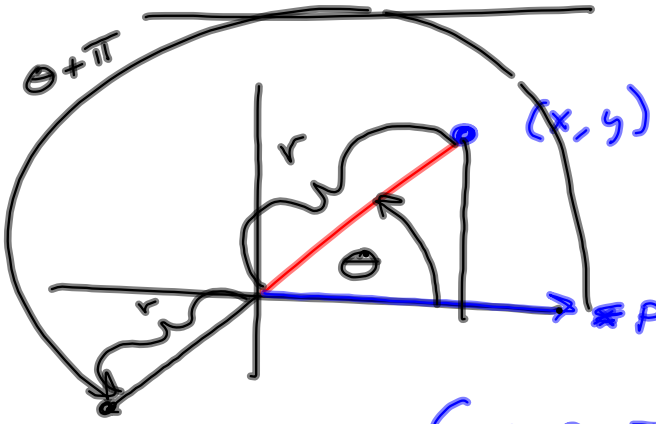
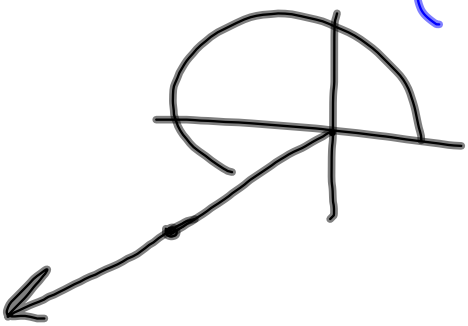
Polar Coordinates

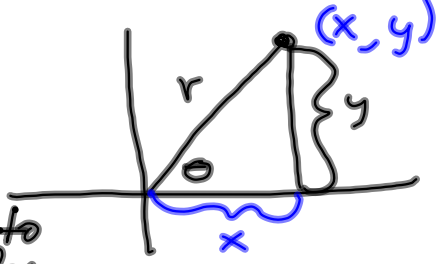


(r, θ) is another way to identify position

$$(-r, \theta+\pi) = (r, \theta) = (r, \theta+2\pi)$$
$$= (r, \theta+2n\pi),\ n \in \mathbb{Z}$$



$(x, y) =$



From polar to rectangular

$x = r\cos\theta$

$y = r\sin\theta$

From rectangular to polar:

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

$$\tan\theta = \frac{y}{x}$$