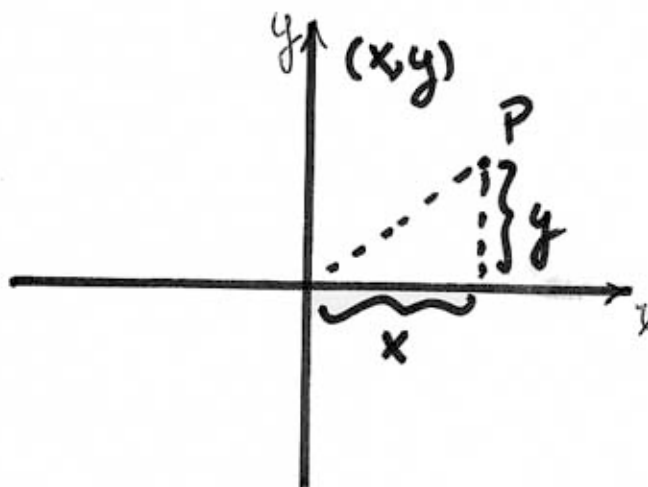
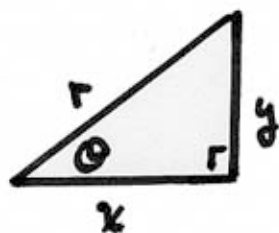


Polar coordinates vs. Cartesian coordinates. (r, θ) 

(a positive angle means
counter-clockwise from the
polar axis)

Relations between polar & Cartesian coordinates.

From



$$x = r \cos \theta$$

$$y = r \sin \theta$$

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

$$\tan \theta = \frac{y}{x} \quad \theta = \tan^{-1}(y/x).$$

It is often convenient to allow negative values for r .

When r is negative, (r, θ) means the point you find by looking in the θ -direction and walking backwards.