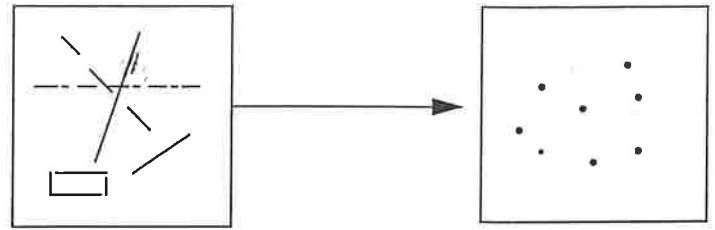
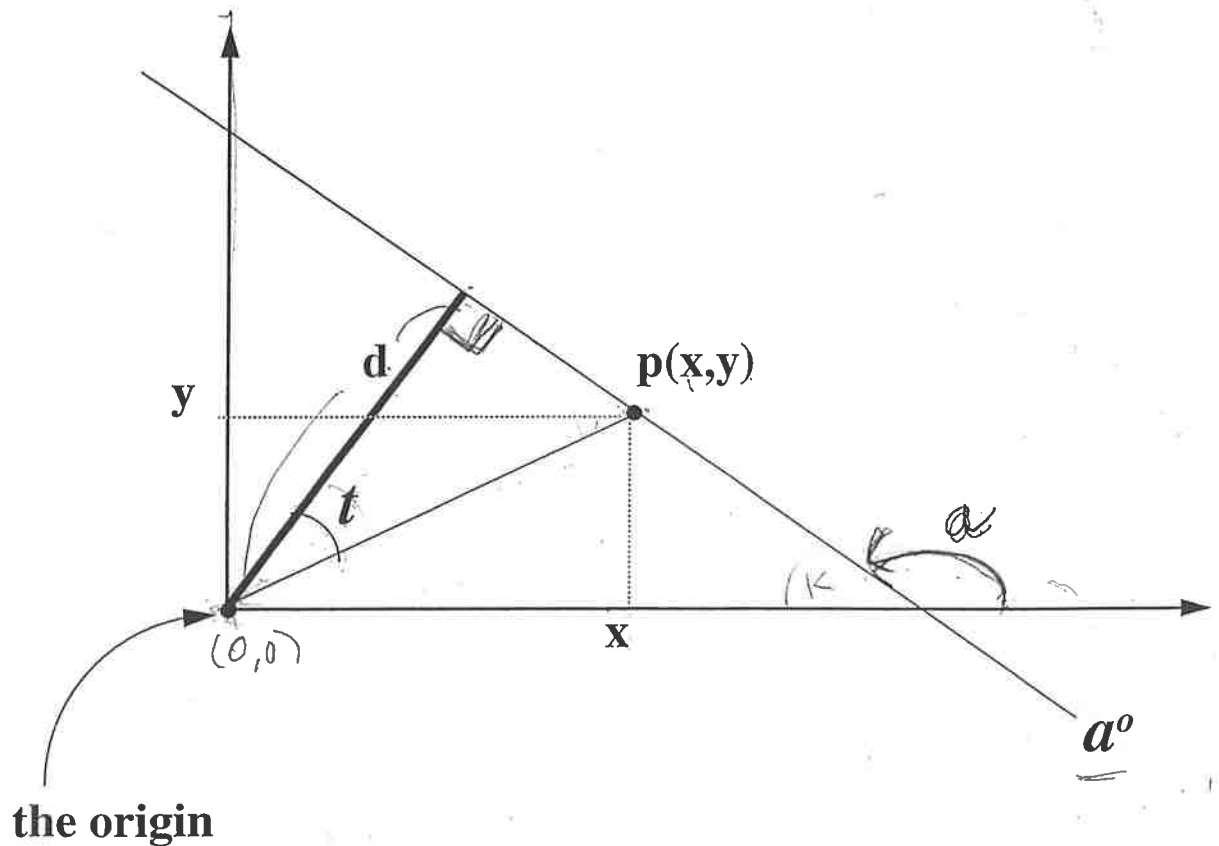


# Hough Transform



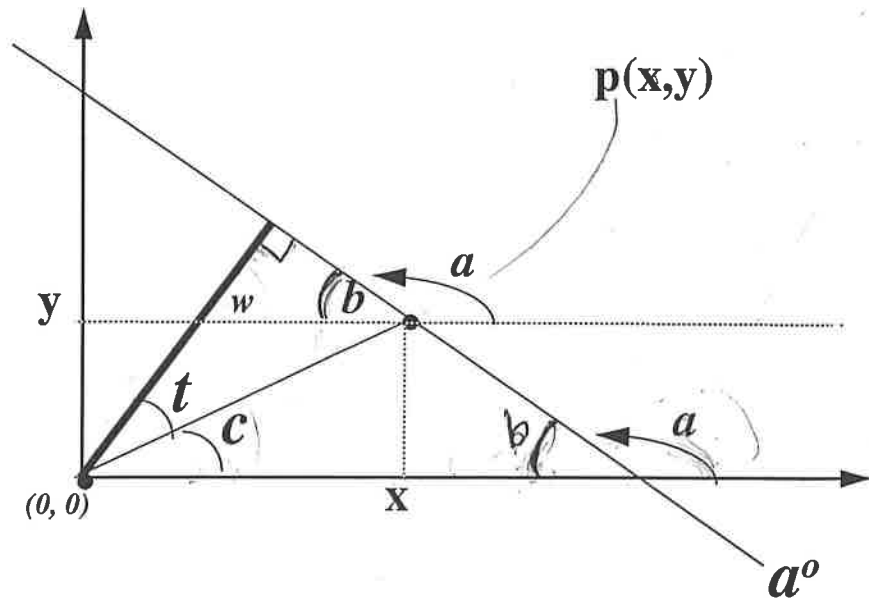
How to compute the “orthogonal distance”  
from a straight line of angle,  $a$ ,  
passing the point,  $p$ , to the origin?



$$d = \sqrt{x^2 + y^2} \cdot \cos(t) + \text{offset}$$

$$t = a - \arctan(y/x) - \pi/2$$

Given:



Prove:  $t = a - c - 90^\circ$

$$b = 180 - a$$

$$w = t + c$$

$$w + b = 90$$

$$w + (180 - a) = 90$$

$$180 - 90 = a - w$$

$$90 = a - w$$

$$90 = a - (t + c)$$

$$90 = a - t - c$$

$$t = a - c - 90$$

$$d = \sqrt{x^2 + y^2} \cdot \cos(t)$$