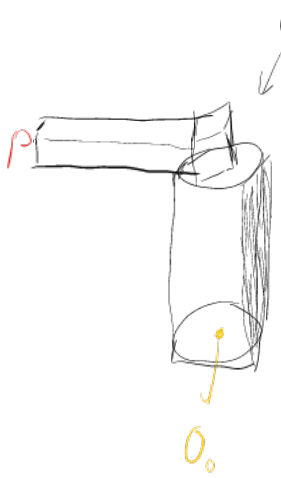

$P^0 = (5, 0, 6.35)$ in meters

a-)

$x \to 10$

$y = -20$

$$H_{x10} = \begin{bmatrix} 1 & 0 & 0 & 0.1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \qquad H_{y20} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & -0.2 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$\text{new } P = H_{x10} \cdot H_{y-20} \cdot P^0 = \begin{bmatrix} 5.1 \\ -0.2 \\ 6.35 \\ 1 \end{bmatrix} \Rightarrow (5.1, -0.2, 6.35)$$

first answer

b-)

$$H = \begin{bmatrix} cs\,90 & -sn\,90 & 0 & 0 \\ sn\,90 & cs\,90 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$\text{new } p = H \cdot \begin{bmatrix} p^0 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 5 \\ 6.35 \\ 1 \end{bmatrix} \Rightarrow (0, 5, 6.35)$$

// second answer