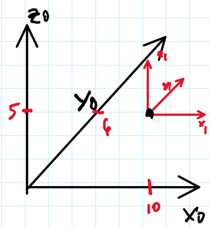
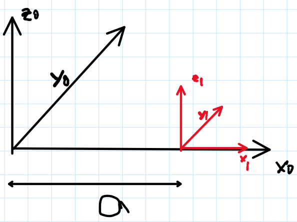
PV: How the translation of Fn is projected on Fn-1.

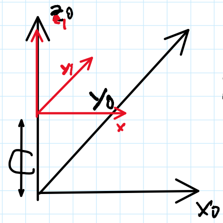
$$ {}^{n-1}_{n}P = \underset{3\times1}{\begin{bmatrix} \square \\ \square \\ \square \end{bmatrix}} \begin{matrix} {}^{n-1}_{n}x \\ {}^{n-1}_{n}y \\ {}^{n-1}_{n}z \end{matrix} $$



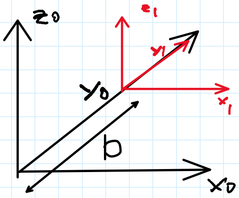
$$ {}^{0}_{1}P = \begin{bmatrix} 10 \\ 6 \\ 5 \end{bmatrix} $$



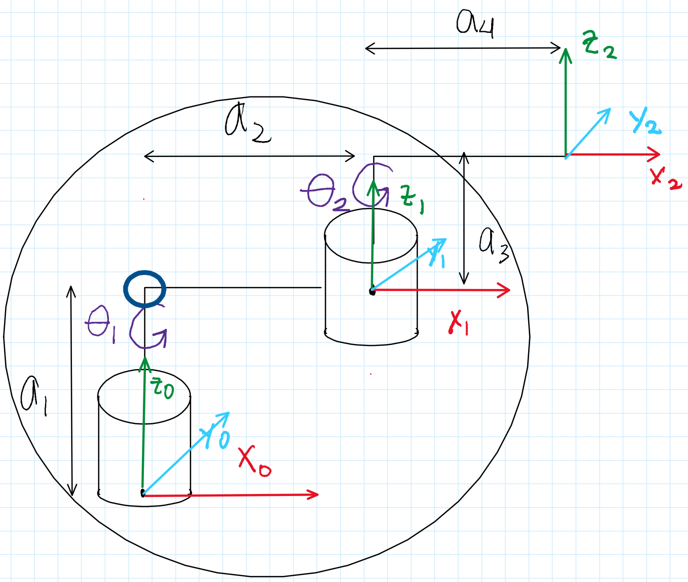
$$ {}^{0}_{1}P = \begin{bmatrix} a \\ 0 \\ 0 \end{bmatrix} $$



$$ {}^{0}_{1}P = \begin{bmatrix} 0 \\ 0 \\ c \end{bmatrix} $$



$$ {}^{0}_{1}P = \begin{bmatrix} 0 \\ b \\ 0 \end{bmatrix} $$

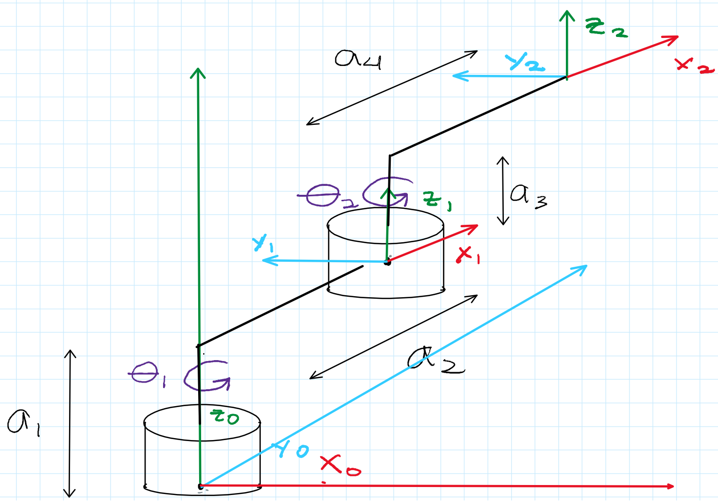


$$ {}^{0}_{2}P \neq {}^{0}_{1}P * {}^{1}_{2}P $$

$$ {}^{0}_{2}P \neq {}^{0}_{1}P + {}^{1}_{2}P $$

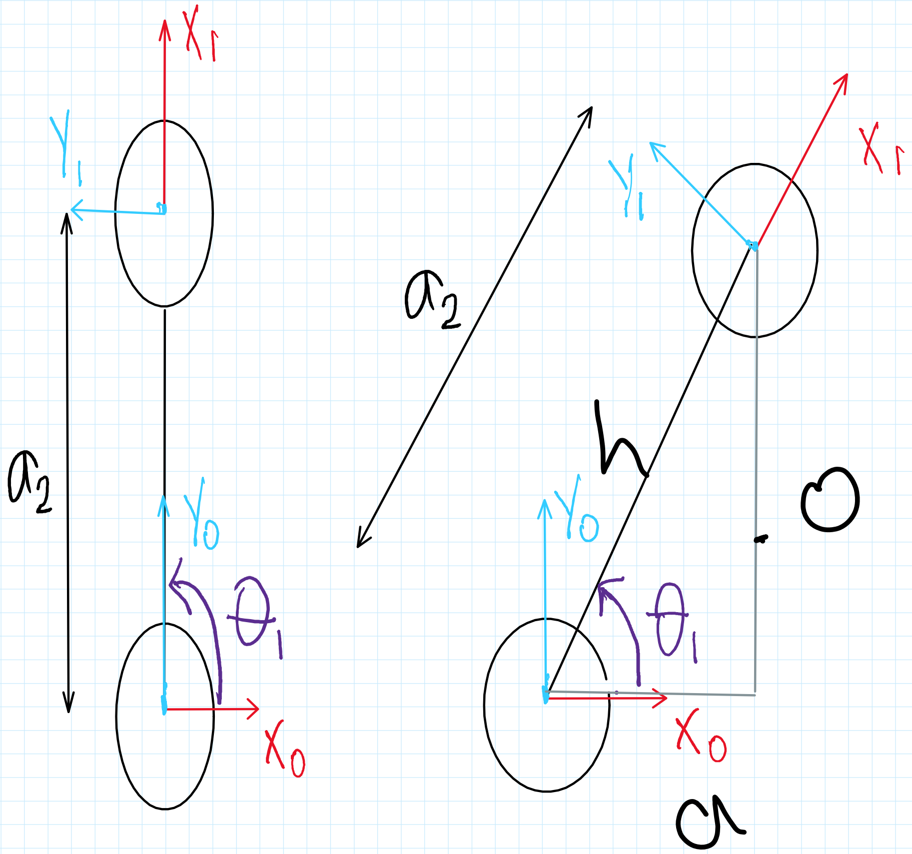
$$ {}^{0}_{1}P = \begin{bmatrix} a_2 \\ 0 \\ a_1 \end{bmatrix} $$

However,



$$ {}^{0}_{1}P = \begin{bmatrix} 0 \\ a_2 \\ 0 \end{bmatrix} $$

Remember: We need to make sure that our position vector is correct no matter what the values of joint variables are.



$$
{}^0_1P = \begin{array}{c} \begin{bmatrix} a_2\cos\theta_1 \\ a_2\sin\theta_1 \\ a_1 \end{bmatrix} \end{array} \begin{array}{c} {}^0_1X \\ {}^0_1Y \\ {}^0_1Z \end{array}
$$

$$\frac{adj}{hyp} = \frac{X_0}{a_2} = \cos\theta_1$$

$$X_0 = a_2\cos\theta_1$$

$$\frac{opp}{hyp} = \frac{Y_0}{a_2} = \sin\theta_1$$

$$Y_0 = a_2\sin\theta$$