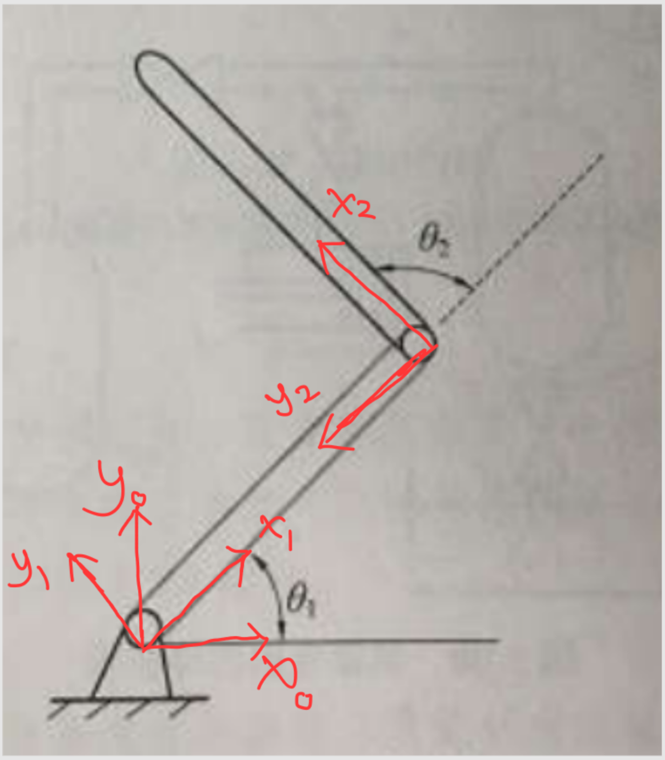
4、 $V = Fu = \begin{bmatrix} 8 \\ 23 \\ 3 \\ 1 \end{bmatrix}$

$H = Trans(20,0,0)\,Rot(y,90)\,F$

$$= \begin{bmatrix} 1 & 0 & 0 & 20 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & -1 & 0 & 10 \\ 1 & 0 & 0 & 20 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 0 & 0 & 1 & 21 \\ 1 & 0 & 0 & 20 \\ 0 & 1 & 0 & -10 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

5、



i	α_i	a_i	d_i	θ_i
1	0	l_1	0	θ_1
2	0	l_2	0	θ_2

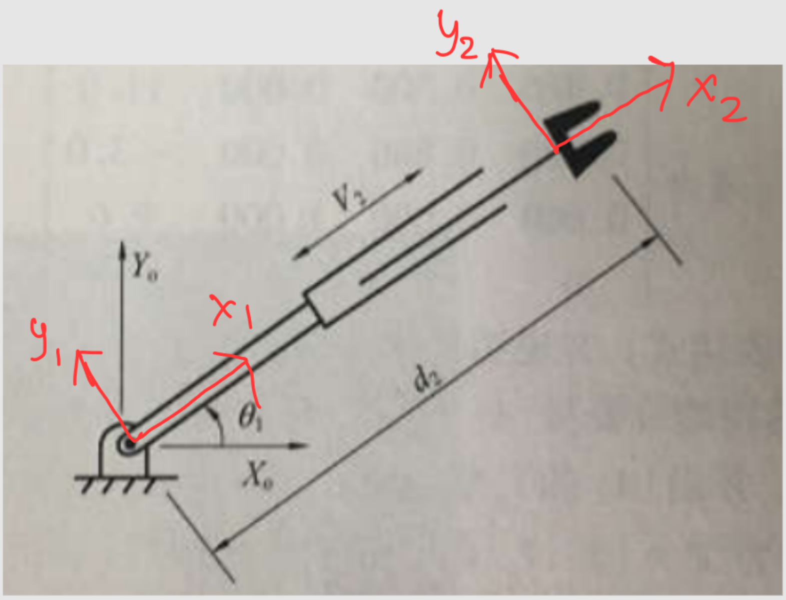
$$A_1 = Rot(Z, \theta_1)\ Trans(l_1, 0, 0)\ Rot(X, 0)$$

$$= \begin{bmatrix} \cos\theta_1 & -\sin\theta_1 & 0 & l_1\cos\theta_1 \\ \sin\theta_1 & \cos\theta_1 & 0 & l_1\sin\theta_1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$A_2 = Rot(Z, \theta_2)\ Trans(l_2, 0, 0)\ Rot(X, 0)$$

$$= \begin{bmatrix} \cos\theta_2 & -\sin\theta_2 & 0 & l_2\cos\theta_2 \\ \sin\theta_2 & \cos\theta_2 & 0 & l_2\sin\theta_2 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

6、



i	α_i	a_i	d_i	θ_i
1	0	0	0	θ_1
2	0	d_2	0	0

$$A_1 = Rot(Z, \theta_1) = \begin{bmatrix} \cos\theta_1 & -\sin\theta_1 & 0 & 0 \\ \sin\theta_1 & \cos\theta_1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$A_2 = Trans(d_2, 0, 0) = \begin{bmatrix} 1 & 0 & 0 & d_2 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$T_2 = A_1 \cdot A_2 = \begin{bmatrix} \cos\theta_1 & -\sin\theta_1 & 0 & d_2\cos\theta_1 \\ \sin\theta_1 & \cos\theta_1 & 0 & d_2\sin\theta_1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

8、

i	a_{i-1}	α_{i-1}	d_i	θ_i
1	0	0	0	θ_1
2	0	-90°	d_2	θ_2
3	a_2	0	0	θ_3
4	a_3	-90°	d_4	θ_4
5	0	90°	0	θ_5
6	0	-90°	0	θ_6

$$T = A_1 A_2 A_3 A_4 A_5 A_6$$