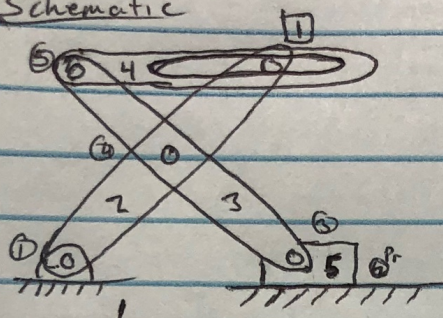


# Analysis of Scissor Lift

## ① Schematic



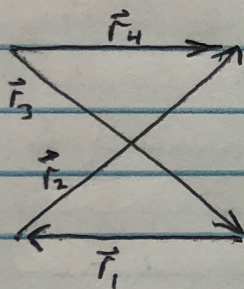
## ② Mobility Analysis

Bodies: 5,  $F_{L,s} = 5$ ,  $F_{2,1} = 1$

$$3(5-1) - 5(2) - 1(1) = 1$$

$$\text{Mobility} = 1$$

## ③ Vectors:



## ④ Unknowns and Knowns

lengths = angles =

$$r_1 = ? \quad \theta_1 = \checkmark$$

$$r_2 = \checkmark \quad \theta_2 = ?$$

$$r_3 = \checkmark \quad \theta_3 = ?$$

$$r_4 = ? \quad \theta_4 = \checkmark$$

## ⑤ Position Equations

CEs: i)  $r_1 = r_4$

ii)  $\theta_3 = -\theta_2$

LEs: i)  $\vec{r}_1 + \vec{r}_2 - \vec{r}_4 + \vec{r}_3 = 0$

~~Known input of  $r_1, r_4$~~

With an input for  $r_1, r_4, \theta_2$ , or  $\theta_3$ , we can geometrically solve for all other unknowns.