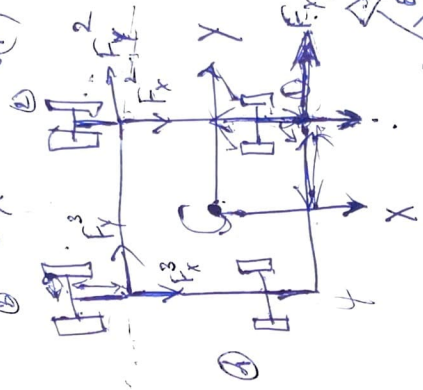


$$\frac{\delta F_x}{\delta F}$$



$$F_p = \begin{bmatrix} F_{x1} \\ F_{y1} \\ M_{p1} \end{bmatrix}$$

$$F = \begin{bmatrix} F_{x1} & F_{y1} & M_{p1} \\ F_{x2} & F_{y2} & M_{p2} \\ F_{x3} & F_{y3} & M_{p3} \\ F_{x4} & F_{y4} & M_{p4} \end{bmatrix} \begin{matrix} 3 \times 8 \\ 8 \times 1 \end{matrix}$$

$$G = \begin{bmatrix} c\theta_1 - s\theta_1 & \dots \\ s\theta_1 & c\theta_1 & \dots \end{bmatrix}$$

$$\begin{matrix} x \sin \theta - y \cos \theta \\ x \cos \theta + y \sin \theta \end{matrix}$$

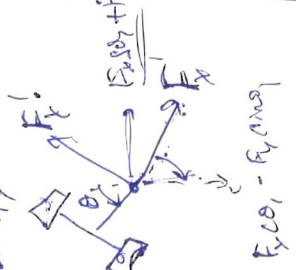
$$F_x^p = F_x^1 \cos \theta_1 - F_y^1 \sin \theta_1 + F_x^2 \cos \theta_2 - F_y^2 \sin \theta_2$$

$$F_y^p = F_x^1 \sin \theta_1 + F_y^1 \cos \theta_1$$

$$G = W \cdot G \cdot K$$

$$F_{y1}x - F_{x1}y$$

$$x^T \begin{pmatrix} 3 \times 8 \\ 8 \times 1 \end{pmatrix} = (3 \times 1)$$



$$F_x \cos \theta_1 - F_y \sin \theta_1$$