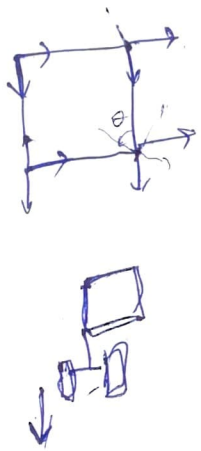
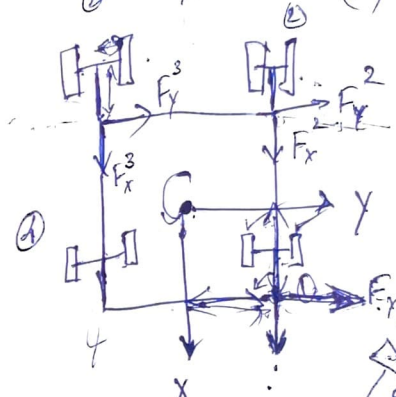
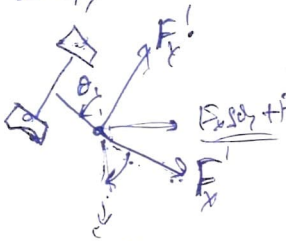
$\frac{\delta F_x^p}{\delta F_x^1}$ $\frac{\delta F_x}{\delta (F)}$







$$F_p = \begin{bmatrix} F_{xp} \\ F_{yp} \\ M_p \end{bmatrix}$$

$$G \quad F = F^p$$

$$\begin{bmatrix} c\theta_1 & -s\theta_1 & \cdots & \cdots \\ s\theta_1 & c\theta_1 & \cdots & \cdots \\ & & & \end{bmatrix} \begin{bmatrix} F_x^1 \\ F_y^1 \\ \vdots \\ F_x^4 \\ F_y^4 \end{bmatrix} = \begin{bmatrix} F_x^p \\ F_y^p \\ M_p \end{bmatrix}$$

3×8 8×1

$x\sin\theta - y\cos\theta$

$x\cos\theta + y\sin\theta$

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

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

$$G = \underset{3\times 1}{W} \cdot \underset{3\times 8}{G} \cdot \underset{8\times 8}{K}$$

$F_{xy}x - F_{xy}y$

$x+$

$(3\times 8)(8\times 1) = (3\times 1)$