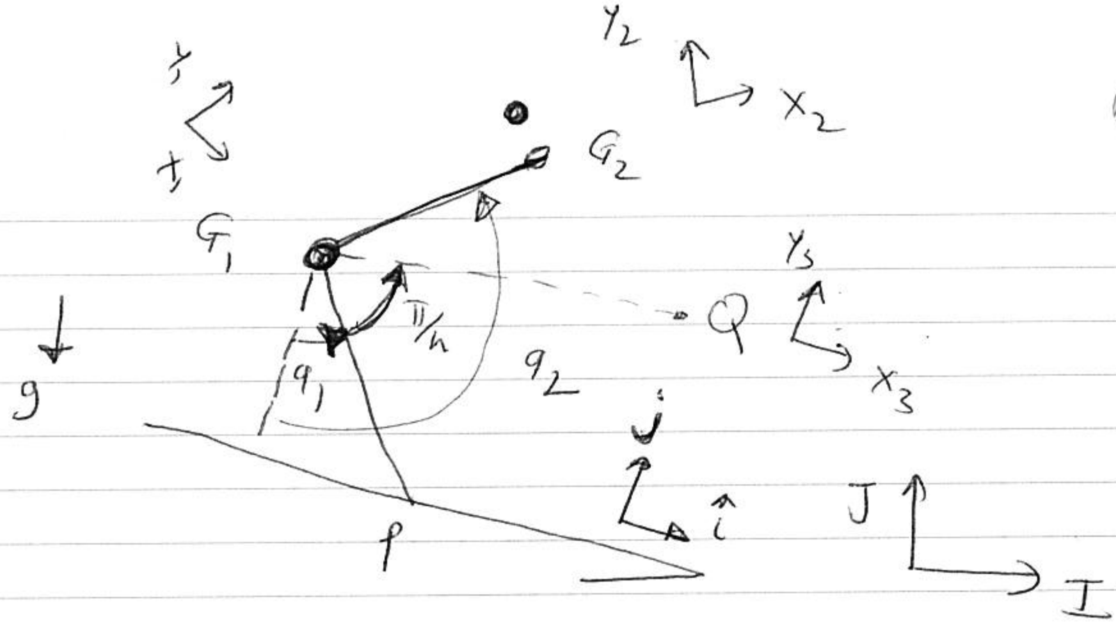
5/24/15



$$X_1 = \sin q_1 \hat{i} - \cos q_1 \hat{j}$$

$$X_3 = \sin(q_1 + \pi/4)\hat{i} - \cos(q_1 + \pi/4)\hat{j}$$

$$X_2 = \sin q_2 \hat{i} - \cos q_2 \hat{j}$$

$$Y_2 = \cos q_2 \hat{i} + \sin q_2 \hat{j}$$

$$\hat{J} = -\sin \gamma \hat{i} + \cos \gamma \hat{j}$$

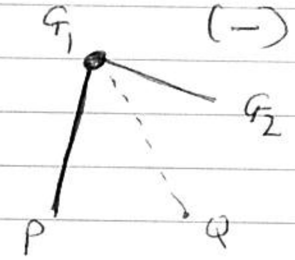
AMB

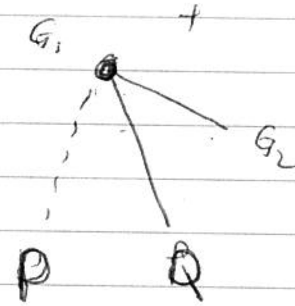
$$-\vec{r}_{G_1/P} \times m_1 g \hat{J} - \vec{r}_{G_2/P} \times m_2 g \hat{J} = \vec{r}_{G_1/P} \times m_1 \vec{a}_{G_1} + I_1 \ddot{q}_1 \hat{k} + \vec{r}_{G_2/P} \times m_2 \vec{a}_{G_2} + I_2 \ddot{q}_2 \hat{k}$$

$$T_2 \hat{k} - \vec{r}_{G_2/G_1} \times m_2 g \hat{J} = \vec{r}_{G_2/G_1} \times m_2 \vec{a}_{G_2} + I_2 \ddot{q}_2 \hat{k}$$

AN

AM





$$\vec{r}_{G_1/Q} \times m_1 \vec{V}_{G_1}^- + \vec{r}_{G_2/Q} \times m_2 \vec{V}_{G_2}^- + I_1 \ddot{q}_1^- \hat{K} + I_2 \ddot{q}_2^- \hat{k}$$

$$= \vec{r}_{G_1/Q} \times m_2 \vec{V}_{G_1}^+ + \vec{r}_{G_2/Q} \times m_2 \vec{V}_{G_2}^+ + I_1 \ddot{q}_1^+ \hat{k} + I_2 \ddot{q}_2 \hat{k}$$

$$\vec{r}_{G_2/G_1} \times m_1 \vec{V}_{G_1} + \cancel{\vec{r}_{G_2/G_1}}\, I_2 \ddot{q}_2^- \hat{k}$$

$$\vec{r}_{G_2/G_1} \times m_2 \vec{V}_{G_2} + I_2 \ddot{q}_2^+ \hat{k}$$

Note: $\vec{V}_{G_1}^-$ & $\vec{V}_{G_2}^-$ are found assuming $\vec{V}_P = 0$

$\vec{V}_{G_1}^+$ & $\vec{V}_{G_2}^+$ are found assuming $\vec{V}_Q = 0$