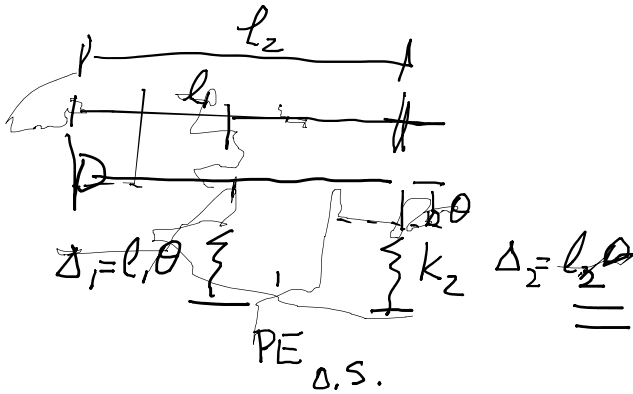




$$PE_{\theta} = \frac{1}{2} k_1 \Delta_1^2 + \frac{1}{2} k_2 \Delta_2^2$$

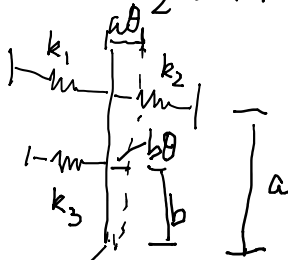
$$= \frac{1}{2} k (l_1 \theta)^2 + \frac{1}{2} k_2 (l_2 \theta)^2$$

$$= \frac{1}{2} (k_1 l_1^2 + k_2 l_2^2) \theta^2$$

$$k_{eq} = k_1 \frac{l_1^2}{l_2^2} + k_2$$

If @ k_1 , then

$$k_{eq} = k_1 + k_2 \frac{l_2^2}{l_1^2}$$



$$PE = \frac{1}{2} (k_1 a^2 \theta^2 + k_2 a^2 \theta^2 + k_3 b^2 \theta^2) + \frac{1}{2} K_t \theta^2$$

$$PE_{eq} = \frac{1}{2} K_{t_{eq}} \theta^2$$

$$PE = \frac{1}{2} k_{eq} \Delta_{eq}^2 = \frac{1}{2} k_{eq} (a \theta)^2$$