

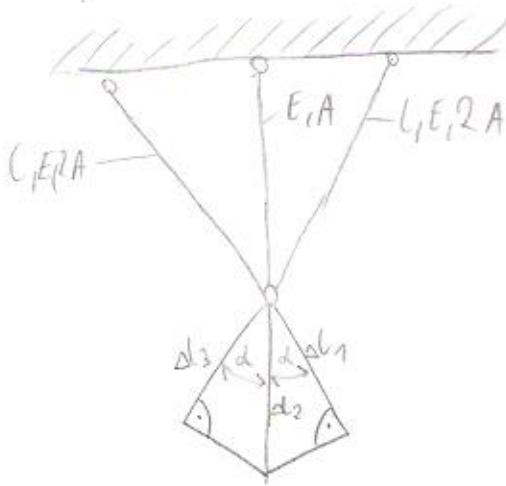
Given:  
 $l, E, d, P, \alpha$   
 $\alpha = 30^\circ$

$$\sin 30^\circ = \frac{1}{2}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\sum F_x = 0 \quad -S_1 \cdot \sin \alpha + S_3 \cdot \sin \alpha = 0 \rightarrow \underline{S_1 = S_3}$$

$$\sum F_y = 0 \quad S_1 \cdot \cos \alpha + S_2 + S_3 \cdot \cos \alpha - P = 0$$



$$\frac{\Delta l_3}{\Delta l_2} = \frac{l \cdot \cos \alpha}{l}$$

$$\frac{S_3 \cdot l}{E \cdot 2A} \cdot \frac{E \cdot A}{S_2 \cdot l \cdot \cos \alpha} = \frac{l \cdot \cos \alpha}{l}$$

$$\frac{S_3}{2 \cdot S_2 \cdot \cos \alpha} = \cos \alpha \quad | \cdot \cos \alpha$$

$$\frac{S_3}{2 \cdot S_2} = \cos^2 \alpha \quad | \cdot S_2$$

$$\frac{1}{2} S_3 = S_2 \cdot \cos^2 \alpha$$

$$S_2 = \frac{S_3}{2 \cdot \cos^2 \alpha}$$

$$\Delta l_1 = \frac{S_1 \cdot l}{E \cdot 2A}$$

$$\Delta l_2 = \frac{S_2 \cdot l \cdot \cos \alpha}{E \cdot A}$$

$$\Delta l_3 = \frac{S_3 \cdot l}{E \cdot 2A}$$

$$S_3 \cdot \cos \alpha + S_3 \cdot \frac{1}{2 \cdot \cos^2 \alpha} + S_3 \cdot \cos \alpha - P = 0$$

$$S_3 \left( \cos \alpha + \frac{1}{2 \cos^2 \alpha} + \cos \alpha \right) = P$$

$$S_3 = \frac{P}{\left( 2 \cos \alpha + \frac{1}{2 \cos^2 \alpha} \right)}$$

$$S_2 = \frac{S_3}{2 \cdot \cos^2 \alpha}$$

$$S_2 = S_3 \cdot \frac{1}{2 \cdot \left(\frac{\sqrt{3}}{2}\right)^2}$$

$$S_2 = S_3 \cdot \frac{1}{2 \cdot \frac{3}{4}}$$

$$S_2 = S_3 \cdot 1 \cdot \frac{4}{6}$$

$$S_2 = \frac{4}{6} S_3$$

$$S_2 = P \cdot \frac{4}{6} \cdot \frac{1}{\sqrt{3} + \frac{4}{6}}$$

$$\sigma = \frac{P}{A} \leq k_v$$

$$\frac{S_2}{A} \leq k_v$$

$$A \geq \frac{S_2}{k_v}$$

$$A \geq P \cdot \frac{4}{6} \cdot \frac{1}{\sqrt{3} + \frac{4}{6}} \cdot \frac{1}{k_v}$$

$$S_3 = P \cdot \frac{1}{2 \cdot \cos \alpha + \frac{1}{2 \cdot \cos^2 \alpha}}$$

$$S_3 = P \cdot \frac{1}{2 \cdot \frac{\sqrt{3}}{2} + \frac{1}{2 \cdot \left(\frac{\sqrt{3}}{2}\right)^2}}$$

$$S_3 = P \cdot \frac{1}{\sqrt{3} + \frac{4}{6}}$$