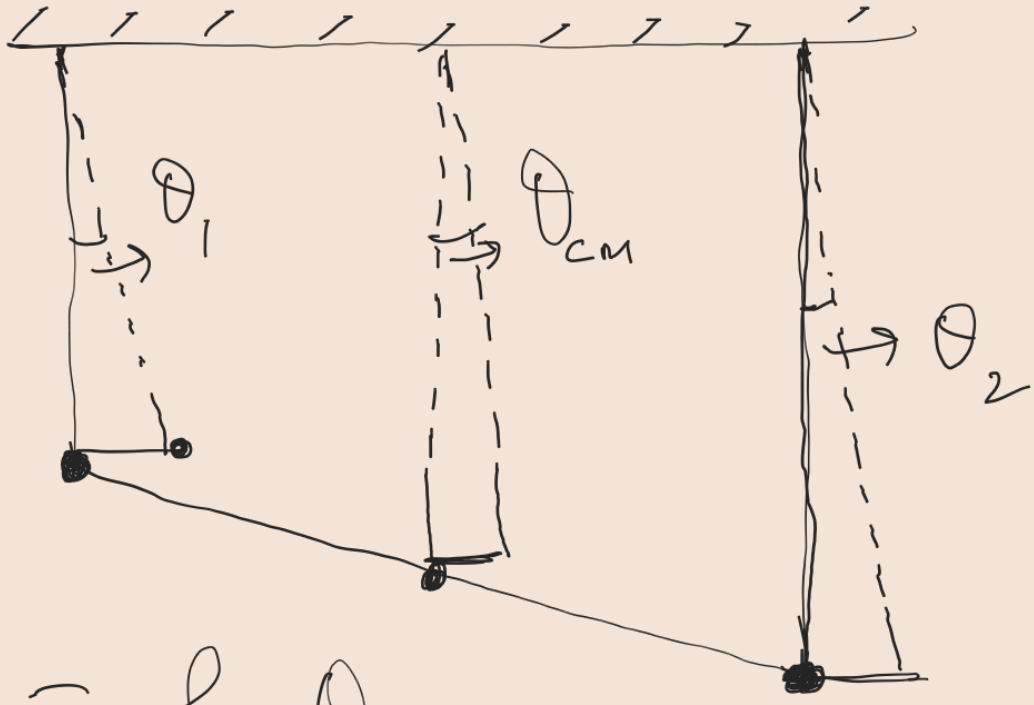
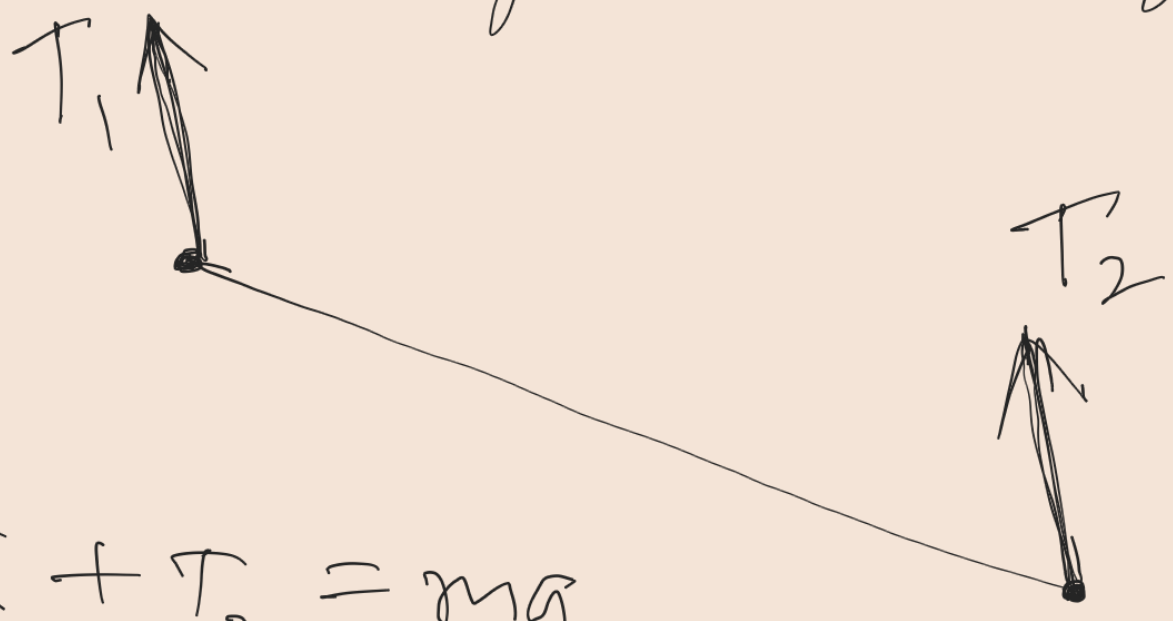


$$l_1\theta_1 = l_2\theta_2$$

(assuming negligible rotation of rod). Here 'θ_1' & 'θ_2' are rotations of the strings.



$$T_1 + T_2 = mg$$

(using approximation).

$$T_1\theta_1 + T_2\theta_2 = m a_{cm}.$$

$$l_1\theta_1 = l_2\theta_2 = x \text{ (say)}.$$

$$\left[\frac{T_1}{l_1} + \frac{T_2}{l_2}\right] x = m a_{cm}.$$

Now two imp observations.

Since all points of rod are displaced equally horizontally,

$x_{cm} = x$ (from equilibrium).

Also, since rod is in rotational equilibrium,

$$T_1 = T_2 = \frac{mg}{2}.$$

Hence,

$$\frac{mg}{2}\left[\frac{l_1+l_2}{(l_1,l_2)}\right]x = ma$$

Time period is

$$\boxed{2\pi\sqrt{\frac{2l_1l_2}{g(l_1+l_2)}}}$$