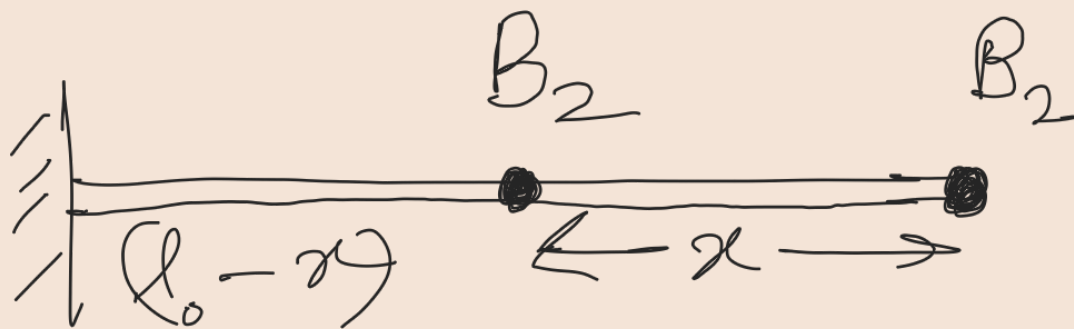


Let's first switch off gravity.



Let beetle B_2 travelled a certain distance ' x ' according to natural length of cord.

Then, ' k ' of section from ceiling to B_2 is

$$\frac{kl_0}{(l_0 - x)} \quad \& \quad \text{the rest part is} \quad \frac{kl_0}{x}$$

Now, let's switch on gravity,

Actual location of
beetle B_2 is

$$(l_0 - x) + \frac{mg(l_0 - x)}{kl_0}$$

$$= l_0 + \frac{2mg}{k} - ut.$$

(it is relative to ceiling in
actual with gravity in
effect). Differentiating
the above equation, we

obtain $\frac{dx}{dt}$, Now

position coordinate of
lower beetle will be

$$l_0 + \frac{2mg}{k} - ut + x + \frac{2mgx}{kl_0}$$

On differentiating the
above equation &
substituting the proper
value of $\left(\frac{dx}{dt}\right)$ from
previous equation, we
get the answer.