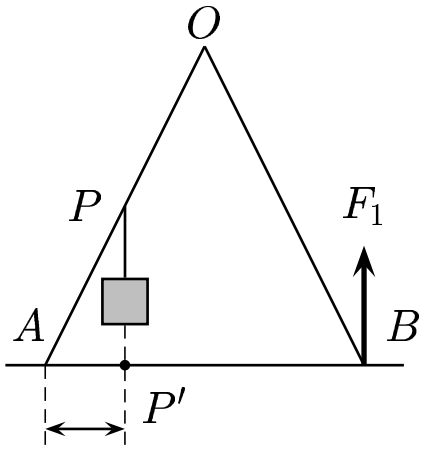
Consider two ladders. Their similarities are as follows. The two legs of both ladders: $\overline{AO} = \overline{BO}$. The mass of both are negligible compared to W, ($\overline{AP} = \overline{PO}$). They both are placed on a frictionless horizontal floor. Their difference,

- For case (1). the junction at O is rigid, but

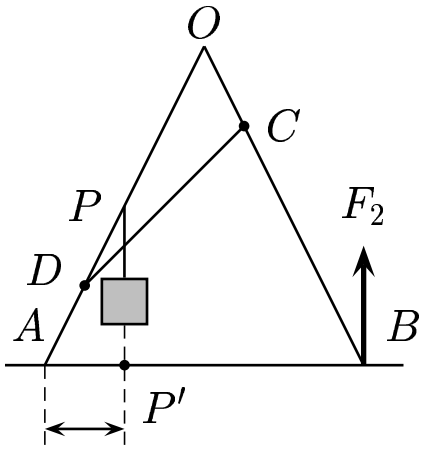
- For case (2). the junction at O is loose.

For (2), There is a connecting rope $\overline{DC}$ to secure the spread.



$\frac{1}{4}\overline{AB}$

(1)



$\frac{1}{4}\overline{AB}$

(2)

Which one is right?

A) $F_1 > F_2$.

B) $F_1 = F_2$.

C) $F_1 < F_2$.

For (1), the torque equation about the pivot point A is given by $\overline{AP'} \times$

$W = \overline{AB} \times F_1$.

For (2), there are additional forces which the string is pulling at C and at D.

These two forces are equal and opposites, they do not effect the torque equation.

So the torque equation for (2) is identical to that for (1).

This leads to $F_2 = F_1$.

Answer **B** .