Consider a ladder. The lengths of the sides: $\overline{AO} = \overline{BO}$. A weight $W$ is attached to the midpoint $P$ ($\overline{AP} = \overline{PO}$). The mass of the ladder is negligible compared to $W$. The ladder rests on a frictionless horizontal floor. Junction $O$ at the top is rigid.

Which one is right?

A) $F_1 = \frac{3W}{4}$.

B) $F_1 = \frac{W}{2}$.

C) $F_1 = \frac{W}{4}$. 
About A, the clockwise torque is,

$$\tau_{cw} = \overline{AP'} \times W,$$

where \( \overline{AP'} = \frac{AB}{4} \).

The counterclockwise torque,

$$\tau_{ccw} = \overline{AB} \times F_1.$$

The equation,

$$\tau_{ccw} = \tau_{cw}$$

gives \( F_1 = \frac{W}{4} \).

Answer C.