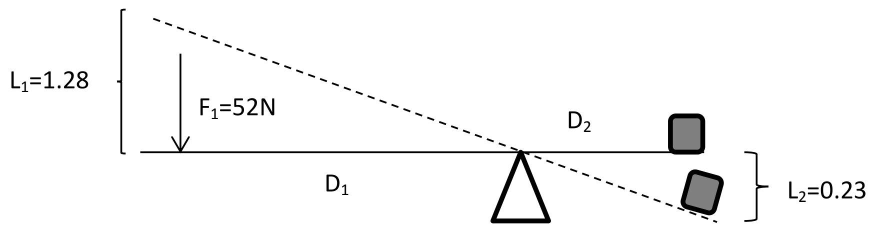
1. The ideal lever does not dissipate or store energy, which means there is no friction in the hinge or bending in the beam. In this case, the power into the lever equals the power out, and the ratio of output to input force is given by the ratio of the distances from the fulcrum to the points of application of these forces. This is known as the law of the lever.

Mathematically, this is expressed by $M_{in} = F_{in} d_{in} = F_{out} d_{out} = M_{out},$

2. Work input = effort force (F_e)*effort distance (D_e)

3.



$$F_1 d_1 = F_2 d_2 \rightarrow \frac{F_1}{F_2} = \frac{d_2}{d_1}; \frac{l_1}{l_2} = \frac{d_1}{d_2} \rightarrow \frac{F_1}{F_2} = \frac{l_2}{l_1} \rightarrow F_2 = \frac{F_1 \cdot l_1}{l_2} = \frac{52 * 1.28}{0.23} \approx 289.4\ N$$

The weight of load is equal to F_2.