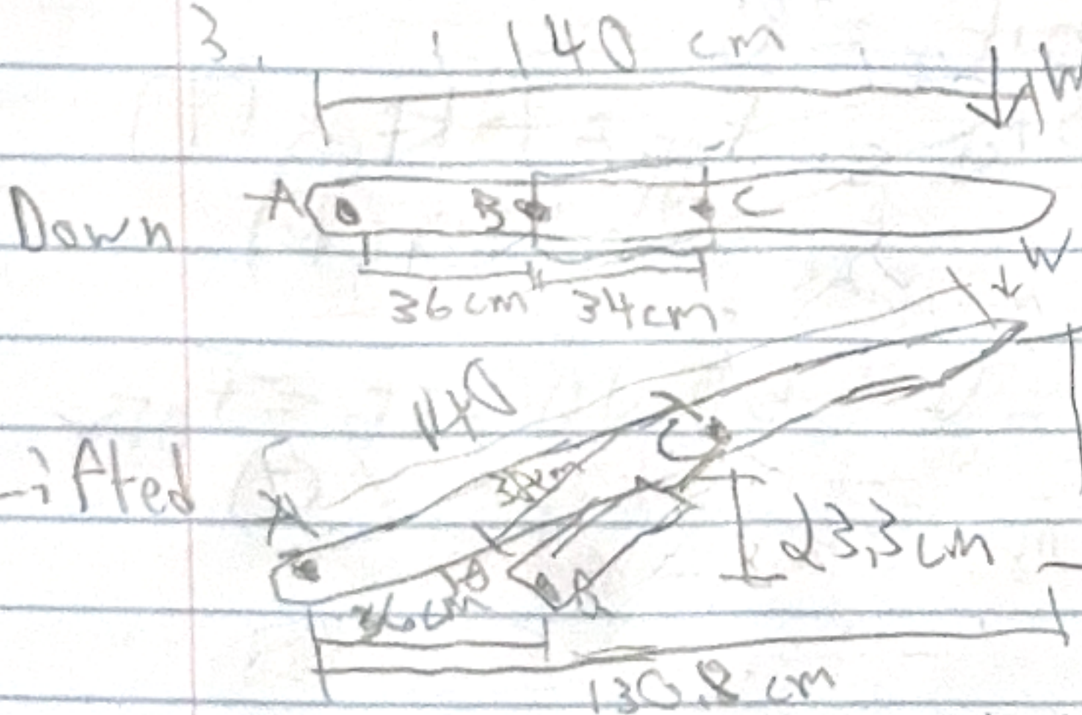
5. Portfolio Problem

Given: 2D design space 150 cm long 50 cm tall
Rigid bar, 3 pins
Find: Create design that optimizes for lifting weight and height

Plan
1. Find actuator 2. Deliberate on Design
3. Create Design

Solution:
1. Actuator: IMA 55 RNO5 max thrust: 35.81 kN
stroke: up to 45.7 cm length: 34 cm
2. Height and Weight are tradeoffs in this situation. So will try to go for something in the middle
3. 140 cm



$\theta = 20.1°$ based on geometry

$\Sigma M_A = 35810 \cdot 23.3\,cm - W_{max} \cdot 130.8\,cm$

$W_{max} = 6388\ N$

Height of 50 cm

Geometry above found from lifting end 50 cm

Reflection:
This was a tricky problem to visualize. The open-endedness was also tricky. My design seems to be able to lift a lot of weight which is good.