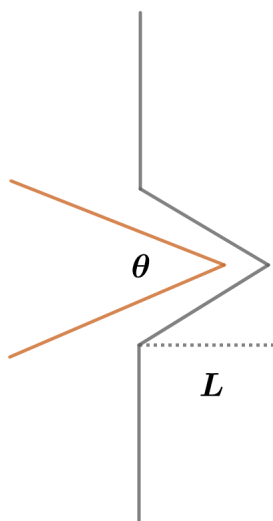# 2020A F=ma Exam: Problem 3

Kevin S. Huang

By conservation of energy,

$$E = F_{ave}L$$

Since the force per contact area F/A is proportional to L and the contact area $A \propto L$ because the axe is wedge-shaped,

$$F_{ave} \propto L^2$$
$$E \propto L^3$$

so

$$\left(\frac{L'}{L}\right)^3 = \frac{2E}{E}$$
$$L' = 2^{1/3}L$$

and the answer is $\boxed{\text{B}}$.