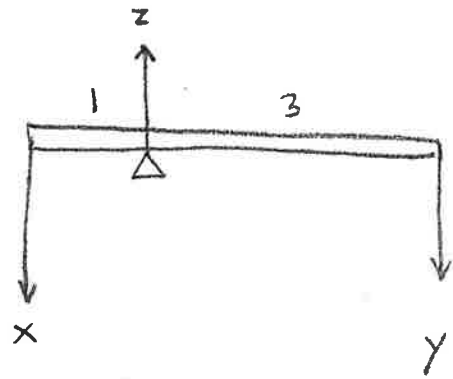
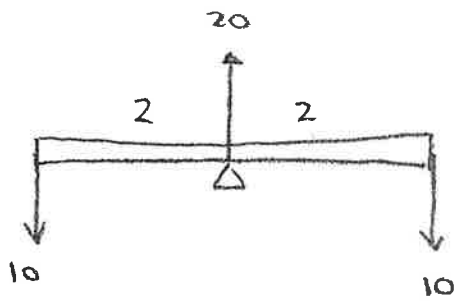


Stick breaking problem

This stick breaks when 10 lbs is applied to each side. The fulcrum must exert 20 lbs to keep it stationary.

What are the values of the forces x , y and z in this case?

a.) From Galileo,
$$\frac{z}{20} = \frac{2 \cdot 2}{1 \cdot 3} = \frac{4}{3}$$

$$z = 80/3$$

Now: what are x and y ? We know from the law of the lever that

$$x \cdot 1 = 3 \cdot y$$

And we know also that $x + y = z = 80/3$

So combining these, $3y + y = 80/3 \Rightarrow y = \frac{20}{3} \text{ lbs}$

and $x = 20 \text{ lbs}$

b.) As the fulcrum moves from the center, the forces grow larger.