question 9

$\frac{1}{2}kx^2 = \frac{1}{2}mv^2$

$\sqrt{\frac{kx^2}{m}} = v_0$

$v_0 = 0$

$\Delta y = \frac{1}{2}at^2$

$\sqrt{\frac{2\Delta y}{a}} = t$

$\Delta x = v_{0x}t + \cancel{\frac{1}{2}at^2}$

$\Delta x = \sqrt{\frac{kx^2}{m}} \cdot \sqrt{\frac{2\Delta y}{a}}$

$2.2 - .27 = \sqrt{\frac{kx^2}{m}} \cdot \cancel{\sqrt{\frac{2\Delta y}{a}}}$

Bob $1.93 =$

* these are like ratios

when spring is compressed x, the ball will travel a certain distance due to k and m being constant

Rhuda wants $\rightarrow 2.2 = \sqrt{\frac{kx^2}{m}} \cancel{\sqrt{\frac{2\Delta y}{a}}}$

$\frac{1.93}{2.2} = \frac{1.10}{x}$

$1.93x = 2.42$

$x = 1.25$ cm

↙ she needs to compress it this much to reach the box