Nevada Miller

#9:

$\mathcal{E}_1 = \frac{1}{2}kx^2$

$\mathcal{E}_f = \frac{1}{2}mv^2$

$v = v_x$ = constant after fall

$v_{y_i} = 0$

$a_y = -9.8\ m/s^2$

$\Delta x = 2.2\ m$

Bobby: $\Delta x = 2.2m - 27\ \cancel{cm} \times \frac{1m}{10^2\ \cancel{cm}} = 1.93\ m$

$\Delta x = v_x t$

$1.93 = v_x t$

$\Delta y = v_{y_i} 0 + \frac{1}{2} a_y t^2$

$\Delta y = 0 - \frac{1}{2} 9.8(t)^2$

$W = Fs \underbrace{\cos\theta}_{\theta = 180^\circ\ = 1}$

$W = Fs \cdot d = Fs \cdot 2.2\ m$

$W = KE_f - \cancel{KE_i}^{\,0} = \frac{1}{2}mv_f^2$

Bobby: $W = (-kx^2)(1.93) = \frac{1}{2}mv_x^2$

$x = 1.1\ cm \times \frac{1m}{10^2\ cm} = 0.011\ m$

$-0.011^2(1.93)k = \frac{1}{2}mv_x^2$

$\frac{2.2m}{1.93\ m} = 1.14$

0.011×1.14 = 0.125 m compressed