Elastic Potential Energy and KE

$KE = 1/2\ m\ v^2$

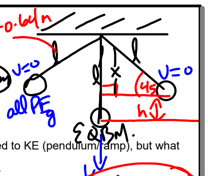
$PE_E = 1/2\ k\ x^2$

$l = x + h$

$h = l - x = 0.64 - 0.45$

$h = 0.19\text{m}$

$PE_g = mgh$



We have looked at how gravitational potential Energy is converted to KE (pendulum/ramp), but what about Elastic Potential Energy?

$\sin 45 = \frac{x}{l}$

$x = 0.64 \sin 45$

$x = 0.45$

$v_{max} = ?$

all KE

$PE_g^{TOP} = KE_{BOTTOM}$

$mgh = \frac{1}{2} m v^2$

$2gh = v^2$

$v = \sqrt{2gh}$

$v = \sqrt{2(9.81)(0.19\text{m})}$

$v = 1.93\text{m/s}$

Consider a bow and Arrow:

full draw

$PE_E = KE$

$\frac{1}{2} kx^2 = \frac{1}{2} m v^2$

$\frac{kx^2}{m} = v^2$

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

Dec 5-10:55 AM