2. $m = .350 kg$

$k = 35.5 N/m$

$x(t=0) = .02 m$

$v(t=0) = .45 m/s$

A. $T = 2\pi\sqrt{\frac{m}{k}} = .624 s$

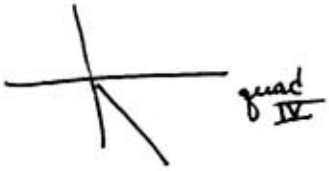
1 $x = A\cos(\omega t + \phi)$ $\quad x' = -\omega A \sin(\omega t + \phi)$

$A\cos(\phi) = .02$ $\quad .45 = -(10.07) A \sin\phi$

$-.0447 = A\sin\phi$

$A = \sqrt{(.02)^2 + (-.0447)^2} = .0490\ m$

$\phi = \tan^{-1}\left(\frac{-.0447}{.02}\right) = -1.107$



should be quadrant IV and is

$x(t) = .0490\cos(10.07t - 1.107)$

$\frac{1}{2}kA^2 = \frac{1}{2}(35.5)(.0490)^2 = .0426$ Joule

$\frac{1}{2}mv_{max}^2 = \frac{1}{2}m\left(\frac{.0490}{.350}\right)^2(10.07)^2 = .0426$ Joule