Question 9:

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

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

$\frac{1}{2}k(.011)^2 + m(10)h = \frac{1}{2}mv^2$

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

$gh = \frac{1}{2}\left(\frac{2.2}{t}\right)$

$2.2\ 2.21 = v(t)$

$v = \frac{2.2}{t}$

$-h = \frac{1}{2}gt^2$

$h = -\frac{1}{2}gt^2$

$g\left(-\frac{1}{2}gt^2\right) = \frac{1}{2}\left(\frac{2.2}{t}\right)$

$50t^2 = \frac{2.2}{2t} \cdot 2t$

$100t^3 = 2.2$

$t = .28025$

$0 = \frac{1}{2}(-10)(.2802)^2 + h$

$h = .3925m$

$\frac{2.2}{.3635} = v$

$\boxed{v = 5.60366\ m/s}$

$v\cos(\theta)t = 2.2$

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

$x = \sqrt{\frac{kx^2 + 2mgh}{m}}\ t$