ADVANCED PHYSICS CLUB

OCTOBER 21, 2018

TODAY'S MEETING

Today we discussed the basics of harmonic motion. We reviewed the equation

$$ma = -k(x - x_0)$$

- Writing the general solution as $x x_0 = A\sin(wt) + B\cos(wt)$ vs $x x_0 = A\sin(wt + \phi)$
- The notions of period, frequency.
- Why this is a good approximation in many cases. What if k < 0? We wrote down the general solution and discussed it.

DISCUSSED PROBLEMS

- 1. Consider a spring with coefficient $\frac{1}{2}\frac{kg}{s^2}$ and mass 1kg attached to it, at rest. Somebody kicks the mass and imparts velocity to it, 2m/s. What will be the amplitude and period of the motion?
- 2. Same spring and mass as before, but now the mass is pulled to distance of 2m from the equilibrium point and released. After how much time is the maximum velocity reached? What would be the value of that velocity?

Homework

1. Consider the system in the figure and assume that the cross section is uniformly A everywhere. What is the frequency of small oscillations about the equilibrium in the figure?

