Pendulae

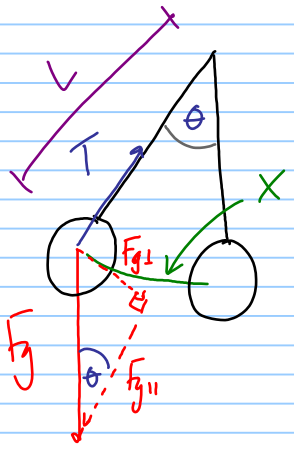
Note Title 12/04/2012

* From last class:

How does A affect T_s for mass on a spring?

" " g " " " " " " " ?

$$T_s = 2\pi\sqrt{\frac{m}{K}}$$



Restoring Force

$$F_{g\perp} = mg\sin\theta$$

Distance from Equilibrium

$$X = L\theta$$

F not $\propto \theta$

$F \propto \sin\theta$

θ(°)	θ(rad)	sinθ
5°	0.08727	0.08716
10°	0.1745	0.1736
15°	0.2618	0.2588

For $\theta < 15°$ or $\theta < 0.26$ rad

$\sin\theta \simeq \theta$

so $F \simeq mg\theta$ $\quad \theta = \frac{x}{L}$

$$F = mg\frac{x}{L}$$

where $\frac{mg}{L} = k$

$$F = kx$$

$$T = 2\pi\sqrt{\frac{m}{K}}$$

$$T = 2\pi\sqrt{\frac{m}{\left(\frac{mg}{L}\right)}}$$

Pendulum Period $\quad T_p = 2\pi\sqrt{\frac{L}{g}}$

$$T_s = 2\pi\sqrt{\frac{m}{K}}$$