Students submitted POD #14.
There is no POD due tomorrow.

We discussed conversion of $\cos(\omega t) + B\sin(\omega t)$ to $C\sin(\omega t + \phi)$ (see Thurs. 6-28 notes). — See MAPLE worksheet 2007-02-28_cde.mw on R-Drive.

Look at 8.5.12 p. 189: #10: Spring #60 lb force stretches spring ½ ft. Remove mass. Somebody grabs spring #1 starts "bouncing" w/ period 1 sec.

How much does the person weigh?

**Solution**

**Hook's Law** $F = \kappa x$; $60 = \frac{k}{2}$

$60 \text{(lb)} = \frac{k}{2} \text{(ft)}$

$k = 120 \text{ lb/ft}$

**1.** $T = \frac{2\pi}{\omega} = 2\pi \sqrt{\frac{m}{k}}$

$\omega = \frac{120}{\sqrt{m}}$

$T^2 = 4\pi^2 \frac{m}{k}$

$m = \frac{T^2 k}{4\pi^2}$

$W = mg = \frac{T^2 k}{4\pi^2} \text{sec}^2 \cdot \frac{1}{16} \cdot \frac{63}{sec^2}$

Finish after class....

$W = \frac{T^2 k}{4\pi^2} \text{ lb}$.

**2.** Use $g = 32 \text{ ft/sec}^2$

**3.** $W = \frac{(1)^2 (120)(32)}{4\pi^2}$ lb

$= \frac{3600}{\pi^2} \text{ lb} \approx 97,268 \text{ lb}. \approx 97 \text{ lb}$.

The person weighs approximately 97 lb.