Comment on Problem 9. Since there is no damping, this is an application of the general formula for the solution of

$$mu'' + ku = F_0 \cos \omega t$$

when $\omega \neq \omega_0 = \sqrt{k/m}$. That is formula (3) in section 3.9 which was also derived in class, namely

$$u = c_1 \cos \omega_0 t + c_2 \sin \omega_0 t + \frac{F_0}{m(\omega_0^2 - \omega^2)} \cos \omega t.$$

In this problem I would work in units of feet and seconds. Then you are told that mg =6 and g=32 ft/sec^2. The spring constant $k = 12$, since the problem gives it in lbs per inch. So $\omega_0 = \sqrt{k/m} = 8$, and c_1 and c_2 are determined by the initial conditions $u(0) = u'(0) = 0$. I think that is what "suddenly" means in the statement of the problem.