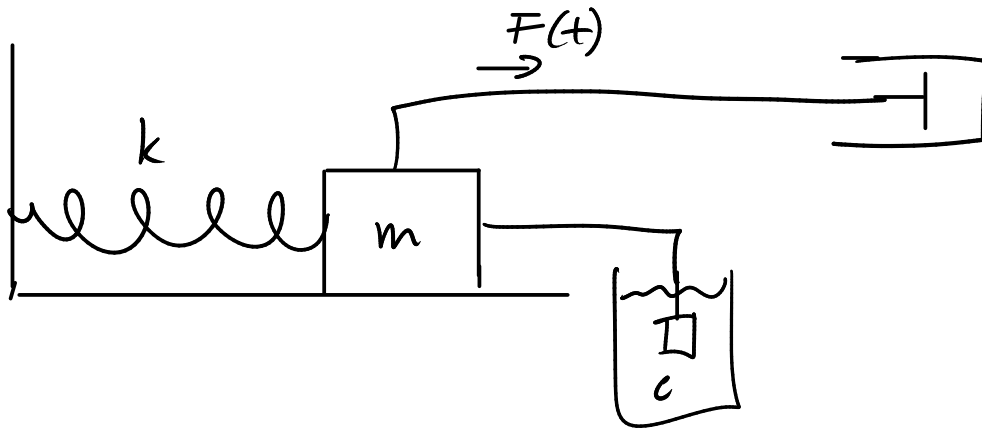


Forced oscillations I

We return to the damped oscillator, but this time we install an external driving force.



Thus Newton's 2nd law gives $ma = -kx - cv + F(t)$

$$m \frac{d^2x}{dt^2} + c \frac{dx}{dt} + kx = F(t)$$

Since the system is subject to an external force, we get a Nonhomogeneous equation.

We will consider a periodic driving force of the form

$$F(t) = F_0 \cos(\omega t)$$

or $F(t) = F_0 \sin(\omega t)$

$\omega =$ angular frequency (radians/second)

$\frac{\omega}{2\pi} =$ ordinary frequency (cycles/second = Hertz = Hz)

$T = \frac{2\pi}{\omega} =$ period (seconds/cycle)

remember 1 cycle = 2π radians.