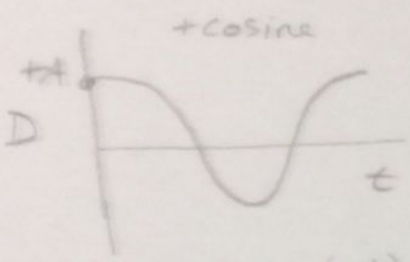
Simple Harmonic Motion - Individual Activity 2

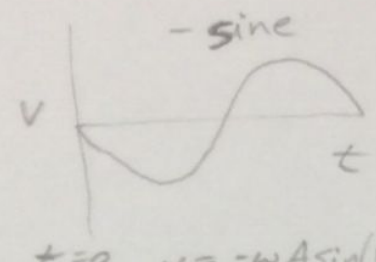
Assume the pendulum (or spring/mass oscillators) start far right.

$\omega = 2\pi f$ Kinematics of SHM (Right (+), Left (−))

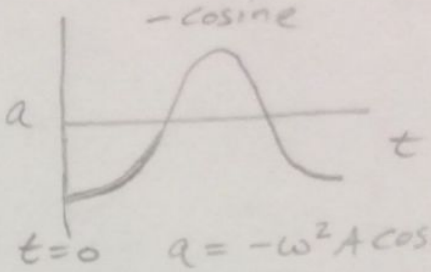
D-t, V-t, a-t graphs are out of phase sinusoidal.



$t=0 \quad x = A\cos(\omega t)$



$t=0 \quad v = -\omega A\sin(\omega t)$



$t=0 \quad a = -\omega^2 A\cos(\omega t)$

$\boxed{x = A\cos(2\pi f t)}$ $\quad V = -A2\pi f\sin(2\pi f t) \quad a = -A4\pi^2 f^2\cos(2\pi f t)$

A = maximum displacement = _____ meters

f = Frequency of oscillation = _____ Hz

t = time = _____ seconds

x = displacement = _____ meters

Pendulum

A pendulum is swinging with a frequency of ___ Hz, and a maximum displacement of ___ meters.

1. After ___ seconds, what will be the displacement x?

2. When the pendulum reaches maximum displacement, what is the velocity of the pendulum?

3. What is the acceleration of the pendulum a maximum displacement?