Physics 2A
Fall 2024

Name _____

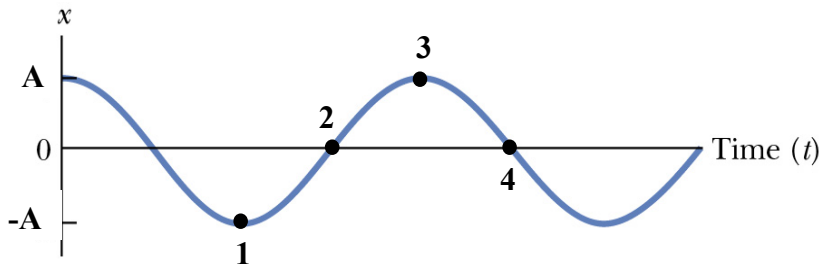
Lab: early late (please circle one)

Quiz #9: Simple Harmonic Motion

Problem 1 (2 points)
A simple pendulum of length L and mass M has frequency *f*. To increase its frequency to 2*f*:

a) increase its length to 4L
b) increase its length to 2L
c) decrease its length to L/2
d) decrease its length to L/4
e) decrease its mass to M/4

Problem 2 (3 points)
A mass connected to a horizontal spring is pulled back a distance x = A and released from rest on a frictionless surface. The figure below shows the position of the mass versus time. Answer the questions below with *one or more* of the four points indicated on the plot.



a) When is the speed equal to zero?

b) When is the acceleration positive?

c) When is the velocity positive?

d) When is the potential energy a maximum?

e) When is the kinetic energy a maximum?

Problem 3 (5 points)
An unknown mass m is attached to a massless spring of constant k = 10.0 N/m. The mass oscillates with a period of T = 0.500 s. The amplitude of the oscillation is measured to be 25.0 cm.

a) What is the mass m?

b) What is the maximum speed of the mass?

c) What is the maximum acceleration of the mass?