Physics 4A
Spring 2025

Name _____

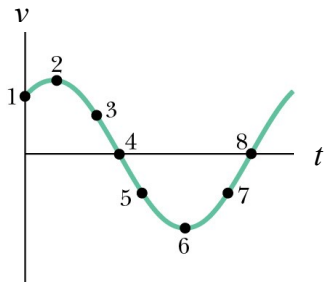
Lab: 8:00 am 11:20 am 2:40 pm (circle one)

Quiz #10: Oscillations

Problem 1 (1.5 points)
A 0.20 kg mass attached to a spring whose spring constant is 500 N/m executes simple harmonic motion. If its maximum speed is 5.0 m/s, the amplitude of its oscillation is

a) 0.0010 m
b) 0.0010 m
c) 0.10 m
d) 0.20 m
e) none of the above

Problem 2 (1.5 points)
The velocity *v*(t) of a particle undergoing SHM is graphed in the figure below. (a) Which of the labeled points corresponds to the particle at x = -A? (b) At point 3, is the acceleration of the particle positive, negative, or zero? (c) At point 5, is the particle at -A, at +A, at 0, between -A and 0, or between 0 and +A?



a)

b)

c)

Problem 3 (2 points)
A tire swing hangs from a branch nearly to the ground. How could you estimate the height of the branch using only a stopwatch. Include an appropriate equation with your explanation.

Problem 4 (5 points)
An object of mass 0.500 kg is connected to a horizontal spring. The object is pulled 25.0 cm and released from rest. The object then oscillates about its equilibrium position with a period of 1.75 s.

a) What is the spring constant of the spring?

b) What is the object's maximum speed?

c) What is the object's speed when it is at x = 7.50 cm?