

Quiz #9: Simple Harmonic Motion

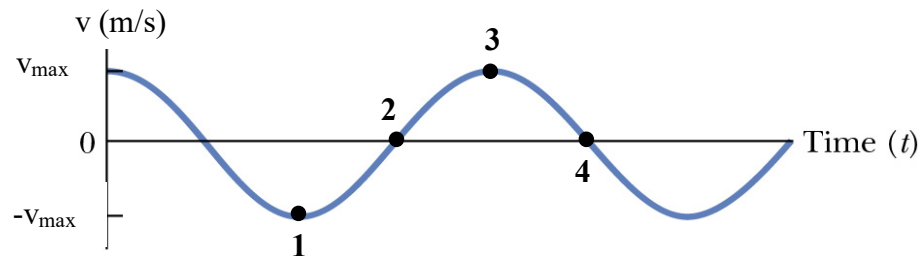
Problem 1 (2 points)

A leaky faucet drips 40 times in 30.0 s. What is the frequency of the dripping?

- a) 1.3 Hz
- b) 0.75 Hz
- c) 1.6 Hz
- d) 0.63 Hz
- e) none of the above

Problem 2 (4 points)

A mass connected to a horizontal spring is oscillating on a frictionless surface in simple harmonic motion. The figure below shows the velocity of the mass versus time as a function of time. Answer the questions below with *one or more* of the four points indicated on the plot.



- a) When is the displacement of the object equal to $x = \pm A$?
- b) When is the acceleration positive?
- c) When is the potential energy a maximum?
- d) When is the kinetic energy a maximum?

Problem 3 (4 points)

A 0.475 kg mass is attached to a horizontal spring ($k = 25.5 \text{ N/m}$) on a frictionless surface. The mass is released from rest a distance of 4.00 cm from the equilibrium position of the spring.

a) What is the period of the mass?

b) Use conservation of energy to find the speed of the mass when it is at $x = 1.5 \text{ cm}$.