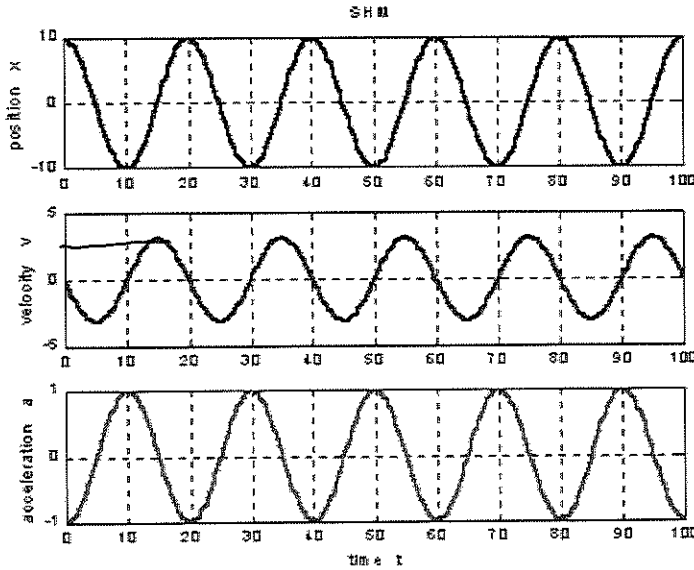


Simple Harmonic motion
Pre-Quiz Activity



All values in the graph are in standard SI units.

A student used a motion sensor on a Spring SHM Oscillator with a mass of .25kg and obtained the graphs shown above.

A) What is the period of this oscillator?

2 sec

B) What is the frequency of this system?

1/2

C) What is the Amplitude of this system?

5

D) What is the spring constant for this oscillator?

Handwritten calculations and diagrams:

- Diagram of a sine wave with amplitude 5.
- Equation: $U_s = \frac{1}{2} K X^2$
- Equation: $U_s = \frac{1}{2} K 5^2$
- Equation: $0.78 = \frac{1}{2} K 5^2$
- Equation: $K = 0.0625 \text{ N/m}$
- Equation: $U_s = \frac{1}{2} K X^2 = U_s$
- Equation: $\frac{1}{2} 0.25 \cdot 2.5^2 = 0.78 \text{ J}$
- Text: "MAX POSITION" with an arrow pointing to the amplitude 5.

E) Write a position equation for this simple harmonic oscillator.

$$X = A \cos(2\pi f t) = X = 5 \cos(2\pi \left(\frac{1}{2}\right) t)$$

F) What is the total energy of this system?

$$X = 5 \cos \pi t$$

0.78 J > see KE →

G) In paragraph format explain what changes would occur to this system if it were allowed to inelastically collide with an equal size mass placed at its equilibrium point.