

# Physics 202

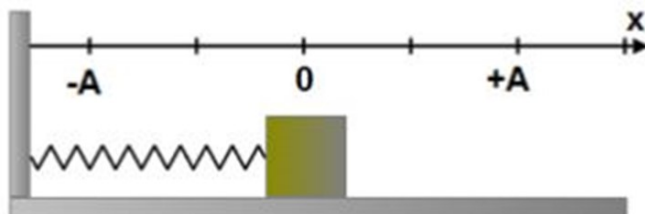
## Group Quizbit | Oscillations

Work as a group to produce a single handwritten solution to these questions. Start with fundamental principles and using multiple representations to communicate understanding of the physics.

1. A mass in the diagram undergoes simple harmonic motion. Use the diagram for the following questions (a) through (d) and choose between the same 5 options for each part.

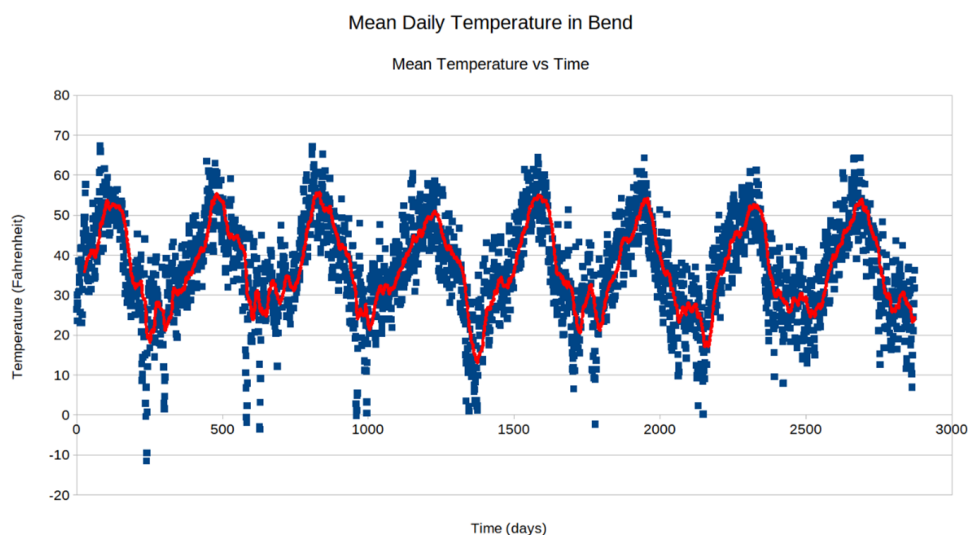
Options:

- (i) Maximum and Positive
- (ii) Maximum and Negative
- (iii) Zero
- (iv) Less than maximum and positive
- (v) Less than maximum and negative



- (a) When the mass reaches point  $x = +A$  its instantaneous velocity is?
  - (b) When the mass reaches point  $x = 0$  its instantaneous velocity is?
  - (c) When the mass reaches point  $x = +A$  its instantaneous acceleration is?
  - (d) When the mass reaches point  $x = 0$  its instantaneous acceleration is?
2. A 0.500 kg mass is attached to a spring and oscillates with a period of  $T = 1.50$  s. How much mass must be added to the system in order to change the period to 2 s?

3. The average daily temperature in the town of Bend, OR is plotted with blue dots in the graph. The time  $t = 0$  days corresponds to April 12th 2013, and the last measurement was taken February 22nd 2021. The red line represents a trendline.



- (a) Is the average daily temperature in Bend, Oregon an example of simple harmonic oscillation? Use words, diagrams, equations, etc... to support your answer.
- (b) Approximately, what is the average daily temperature's period of oscillation?
- (c) Approximately, what is the amplitude of the average daily temperature's oscillation?
- (d) Use the red trendline to construct an equation that approximately describes the oscillation of the temperature as a function of time only, i.e.  $T(t) = ?$