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**Due:** Mon Sep 18 2017 07:30 AM MDT
1. Question Details

The graph below shows the electric potential in a circuit as a function of time. Potential, $V$, is in volts and time, $t$, is in seconds.

In a previous problem you created a graph of $\frac{dV}{dt}$.

Use the previous problem and your graphs to answer the questions below.

The graph of $V$ is shaped a lot like a sine or cosine function.

Any function with a graph like this is called an oscillator or an oscillating function.

Oscillators have two key features:

- **Amplitude**: is half the vertical distance between high and low points on the graph.
  - What is the amplitude of $V(t)$? (units required!)

- **Period**: is the horizontal distance (time) that it takes for the graph to complete one full cycle.
  - What is the period of $V(t)$? (units required!)

True or false, $\frac{dV}{dt}$ is also an oscillating function.

- True
- False

What is the period of $\frac{dV}{dt}$? (units required!)

What best describes the amplitude of $\frac{dV}{dt}$?

- Same as the amplitude of $V(t)$.
- More than the amplitude of $V(t)$.
- Less than the amplitude of $V(t)$.

Which of these units would be best for the amplitude of $\frac{dV}{dt}$?

- Volts
- Seconds
- Volts per second
- None of these

From the choices below select the best graph of $\frac{dV}{dt}$.

Assume that the vertical axis of each graph has the units that you selected in the previous question.
WARNING! You get **only one try**.
Think. Don't guess.

An object is launched straight up. Its height as a function of time is given in the table below.

| t (s) | 0.0  | 0.1  | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  | 1.1  | 1.2  | 1.3  | 1.4  | 1.5  |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| h (m) | 5.00 | 5.65 | 6.20 | 6.66 | 7.02 | 7.28 | 7.44 | 7.50 | 7.46 | 7.33 | 7.10 | 6.77 | 6.34 | 5.82 | 5.20 | 4.48 |

Answer the following questions. You will be allowed multiple tries, but not the unlimited number you usually get, so be careful. Don't burn up all your tries on guesses.

**WARNING!** The WebAssign tolerances are set much tighter than they were in the Basic homework.

This means you will have to make judgments about heights and velocities at times other than what you see in the table.

Find the height at the instant when the velocity is -5.2 m/s.

Find the velocity at the instant the height is 6.43 meters and the object is headed up.
8/28/2017

Group: **BSU Calculus**
Randomization: **Person**
Which graded: **Last**

Assignment Previewer

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