

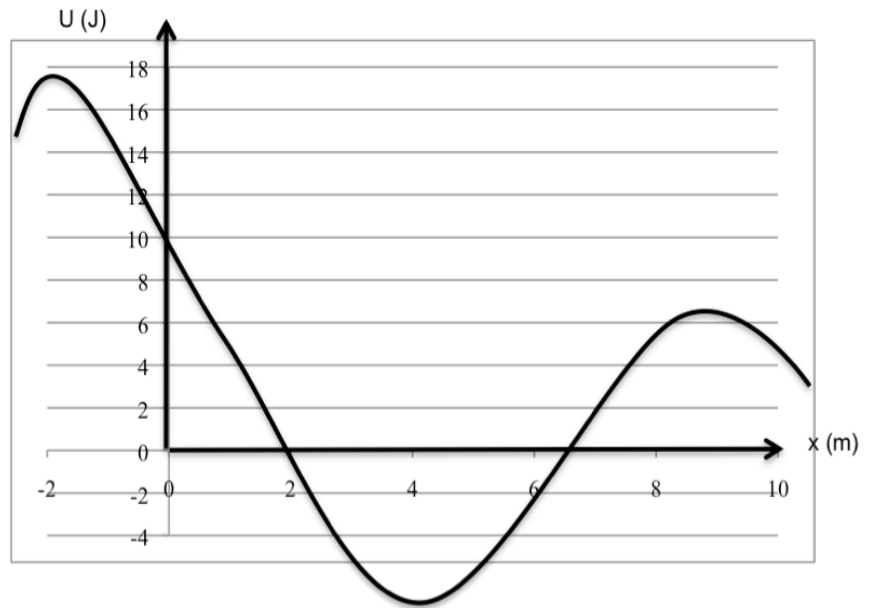
Big Exam #3

1. You see below a potential energy diagram for a **2 kg block**, as a function of displacement. (positive x is to the right). The block **starts out at $x = 0$ moving at 2 m/s** to the left. *There may be more than one correct answer. In this case, list all correct answers. State lens when appropriate.*

- Label stable equilibria with "S"
- Label unstable equilibria with "U"
- Label any turning points with "T"
- Where does the block attain its highest speed, and what is this v_{max} ?
- What is the approximate acceleration of the block at $x = 6\text{m}$? (What two concepts are necessary for this?)

Include direction in your answer, with a unit vector or an arrow.

***Recognize that the cart is not moving up and down on the y axis. The movement is in the x direction only. The y axis is the energy, which could be the result of some electric field, g , magnets, springs, rubber bands, etc.



2. An object starts at 10 m and has a velocity of $v(t) = 6 \text{ m/s} - 4 \text{ m/s}^2(t) + 3 \text{ m/s}^3(t^2)$. Find the acceleration, velocity, and position at 3 seconds.