# Assignment 3

Name: _____**Student ID:** _____

Instruction

- **Your problem-solving steps should be clearly shown to get the full credit.**

1. Give one example of a transverse wave and one example of a longitudinal wave, being careful to note the relative directions of the disturbance and wave propagation in each. (2 Points)

2. Shown below are three waves that were sent down a string at different times. The tension in the string remains constant. (a) Rank the waves from the smallest wavelength to the largest wavelength. (b) Rank the waves from the lowest frequency to the highest frequency. (2 Points)
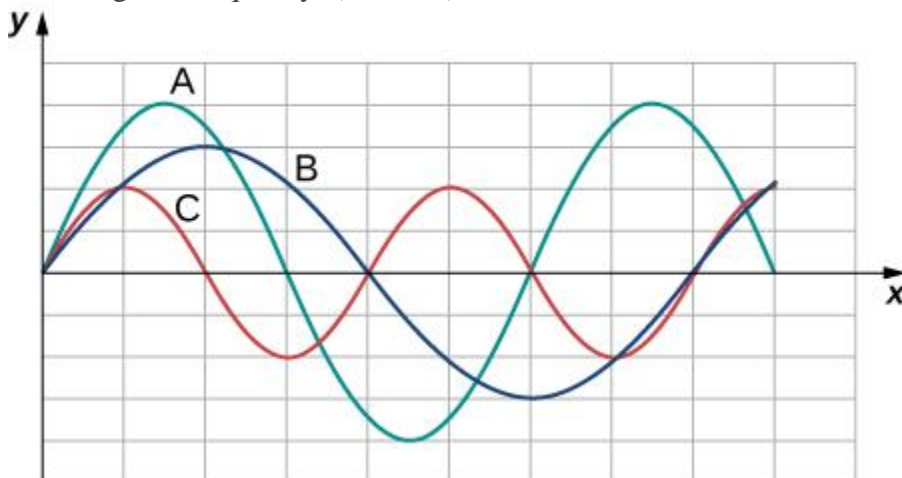
3. The average intensity of sunlight on Earth's surface is about $1000 \; W/m^2$ (2 Points)
   a. Calculate the solar panel area if the amount of energy that falls on it in 10 hours is 3×10^{12} J.
   b. What intensity would such sunlight have if concentrated by a magnifying glass onto an area 100 times smaller than its own?

4. What is the difference between propagation speed and the frequency of a mechanical wave? Does one or both affect wavelength? If so, how? (2 Points).

5. The length of a tube closed at one end is 50 cm. What is the fundamental frequency of the tube if the air temperature is 27 °C? (2 Points).