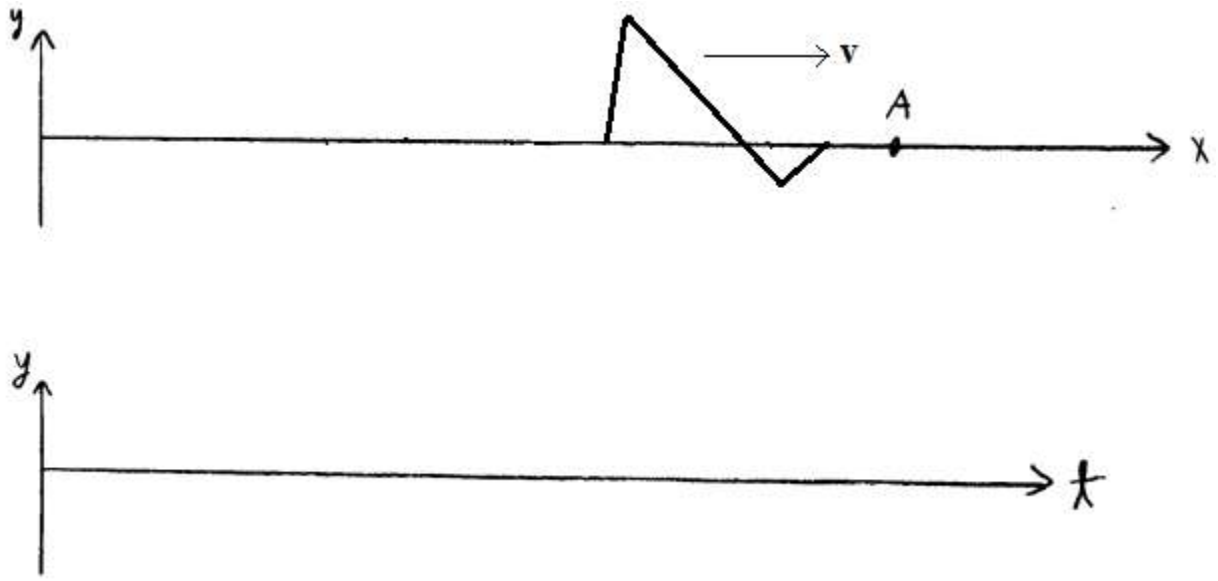
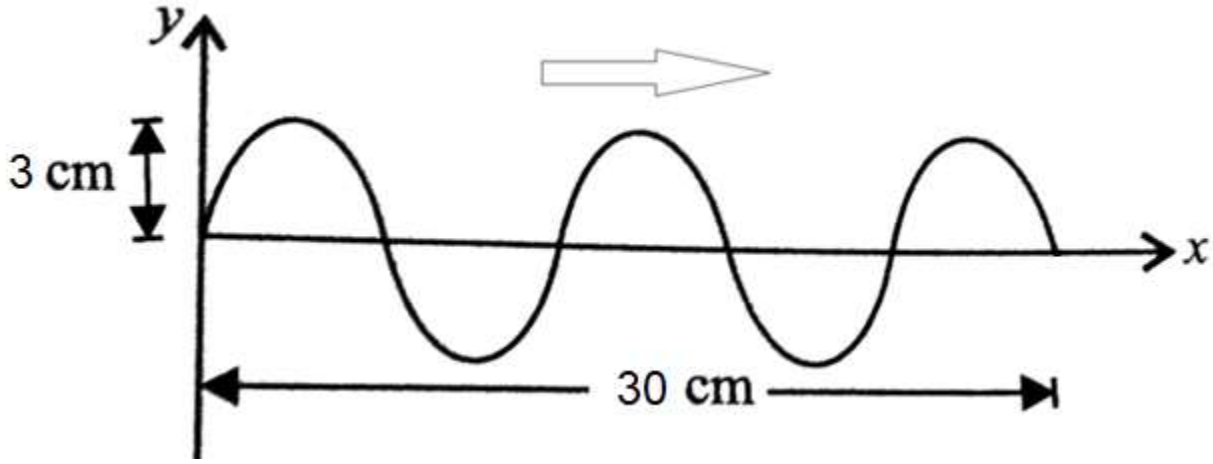
1. A 2.00 kg air-track glider is attached to a spring with spring constant of k = 100 N/m. Show your work on paper. Enter just your numerical answers on Canvas,
    a. If the glider oscillates with an amplitude of 10 cm, what is the period of its oscillation?
    b. If the glider oscillates with an amplitude of 20 cm, what is the period of its oscillation?

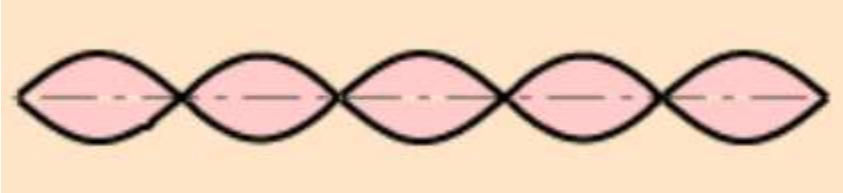
2. The diagram below shows a snapshot graph of a wave on a string that is travelling to the right at time t=0. In the second graph, draw a history graph representing the motion of point A. (2 points). Show your work on paper. Just enter "done" in Canvas.



3. The figure below shows a wave travelling on a string at time t = 0 s. Note that the wave is travelling to the **right**. The frequency of the wave is 20 Hz. Show your work on paper. Enter just your numerical answers on Canvas. You do not need to enter the wavefunction (part c) on Canvas.
    a. Find the wavelength of the wave and the wavenumber k of the wave. (Consider how many wavelengths are shown in the picture carefully!)
    b. Find the speed of the wave.
    c. Write the wavefunction of the wave, with the values for the constants included.
    d. What is the maximum transverse (vertical) speed of a particle on the string?

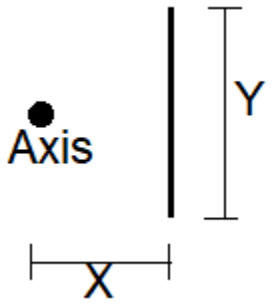


4. The figure below shows a 600 Hz standing wave on a string of length 4.00 m and mass 5.00 g. Show your work on paper. Enter just your numerical answers on Canvas,
    a. What is the tension in the string? (Don't forget to convert from grams to kg).
    b. What is the frequency of the n=1 (fundamental) standing wave on this string?



5. The moment of inertia of a thin uniform rod of mass M, length Y a distance X away from an axis perpendicular to the rod, as shown in the first figure, is given by

$$I = M\left(\frac{1}{12}Y^2 + X^2\right)$$



Use the above relation to find the moment of inertia of a rectangular sheet with uniform density σ and dimensions HxW about an axis a distance L away from the left-hand side, as shown in the figure below. You may leave your answer in terms of σ (as opposed to the mass of the sheet). (Warning: the final answer is not particularly "pretty", so don't worry about simplifying it).Show your work on paper. Just enter "done" on Canvas.