Name : ANN SIRS

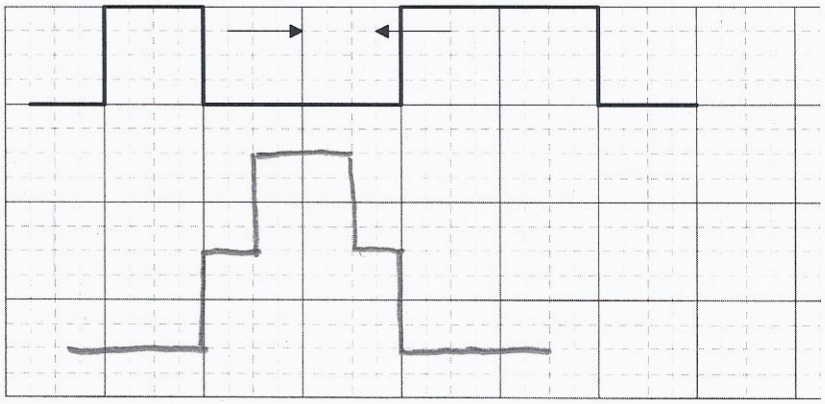
SPH3UI : Waves & Sound Assignment

1. The wave pulse shown below is incident on a fixed end. Draw the resultant reflected wave.

2. A mosquito beats its wings at a rate of about 6,000 wing beats per minute.
   a. What is the frequency in Hertz of the sound wave created by the mosquito's wings? 100Hz
   b. Assuming the sound wave moves with a velocity of 350 m/s, what is the wavelength of the sound wave generated by the beating wings? $\lambda = 3.5m$

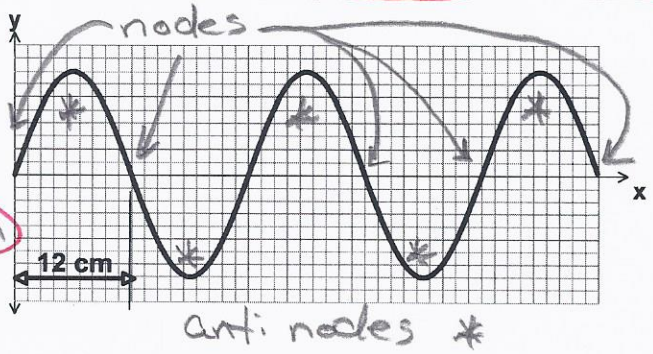
3. A large crest of water requires 8 seconds to travel from a fishing boat to the pier which is 32m away. While sitting on the boat, the fishermen notice that 12 crests pass the boat in 24 seconds. What is the wavelength of the waves? $V = 4m/s$, $f = 0.5Hz$ $\Rightarrow$ $\lambda = 8m$

4. Draw the resultant wave form when the two waves illustrated below interfere. Make sure you draw the interference when centres of the two wave pulses are aligned.



5. The distance between the 3th and 9th nodes in a standing wave is 75cm. What is the wavelength of the waves? What is the speed of the waves if the source has a frequency of 250Hz? $\lambda = 25cm$ $V = 6250 cm/s$

6. The diagram to the right is a standing wave.
   a. Label nodes and anti-nodes on the diagram.
   b. How many nodes are their? 6
   c. How many anti-nodes are their? 5
   d. Determine the wavelength of the standing wave. 24cm
   e. If the frequency is 20HZ, what is the velocity of the wave? 480cm/s



7. The temperature of the air is 20°C and the sound being produced has a frequency of 440HZ.
   a. What is the length of an ***open ended air column*** that has a 1st resonant wavelength for this sound?
   b. What is the length of a ***closed ended air column*** that has a 1st resonant wavelength for this sound?

$V = 332 + 0.59(T) = 344 m/s$, $\lambda = \frac{V}{f} = 0.781m$

a. $L = \frac{1}{2}\lambda = 0.39m$

b $L = \frac{1}{4}\lambda = 0.195m$