

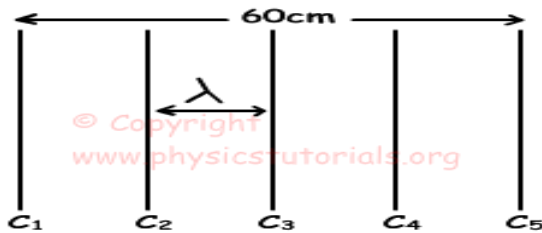
Physics Extra Sheet 1

Exercise 1 Answer the following questions: (6 pts)

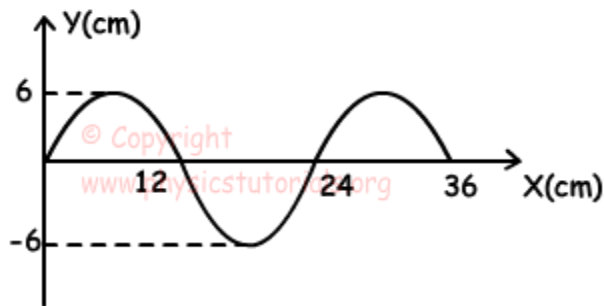
1. Which ones of the following statements change wavelength of the wave.

- a) Changing frequency of wave source
- b) Moving wave source
- c) Changing water level of tank

2. If distance between 5 crests is 60 cm and frequency of the wave source is 3Hz, find velocity of wave.



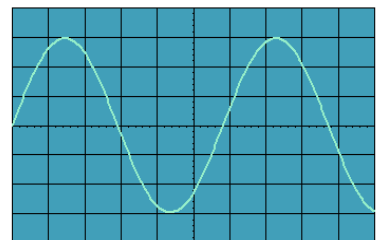
3. Picture given below shows wave motion of source having frequency 2Hz.



- a) Find wavelength
- b) Velocity
- c) Amplitude of wave.

4. We photograph the screen of an oscilloscope to which a receiver is connected. The chosen time base is 1ms/div.

- a) Calculate the period and the frequency of the detected sound.
- b) Calculate the wavelength of the sound in air. The velocity of sound in air is 340m/s.



Exercise 2 Standing waves. (5 pts)

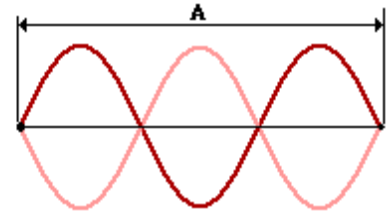
A rope of length $A = 3.27\text{m}$ is fixed at its two end, and set into vibration. A system of standing waves is obtained and 3 spindles are represented.

The speed at which waves move along the rope is 2.62 m/s .

a- Determine the frequency of the waves creating the standing wave pattern.

b- Calculate the distance between 2 consecutive Node and Anti-Node.

c- Calculate the new wavelength, and then determine the number of spindles which would be measured in 20.0 seconds.



Exercise 3 Interference waves. (6 pts)

The two extremities S_1 and S_2 of a vibrator vibrating in phase are 5cm apart.

The frequency of the vibrations is $f = 20\text{Hz}$ and the speed of the transverse wave on water surface is $c = 0.36\text{ m/s}$.

Consider a point M variable on the surface of the water, such that $S_1M = d_1$ and $S_2M = d_2$.

a) Describe the phenomenon that occurs on the surface of the water. Is the perpendicular bisector of S_1S_2 of maximum amplitude or of minimum amplitude?

b) Specify the vibratory state of the following points.

M_1 ($d_1 = 10\text{cm}$; $d_2 = 11.8\text{cm}$) M_2 ($d_1 = 14.7\text{cm}$; $d_2 = 16,5\text{cm}$)

c) Determine the number of fringe of maximum amplitude and the number of minimum amplitude observed the surface of the water. Represent these fringes.