

Unit No/Name	Subject Name	Teacher Name	Date
Waves, sound and light	Waves Properties 1.3 & 1.4	Ayman Al Omari	
Student No:		Student Name:	
		Group:	VEDC+

Solve the following problems.

$$\text{frequency} = \frac{1}{\text{period}} \quad \text{Or} \quad f = \frac{1}{T}$$

$$\text{period} = \frac{1}{\text{frequency}} \quad \text{Or} \quad T = \frac{1}{f}$$

$$\text{Wave speed} = \text{frequency} \times \text{wavelength} \quad \text{Or} \quad v = f\lambda$$

$$\text{frequency} = \frac{\text{wave speed}}{\text{wavelength}} \quad \text{Or} \quad f = \frac{v}{\lambda}$$

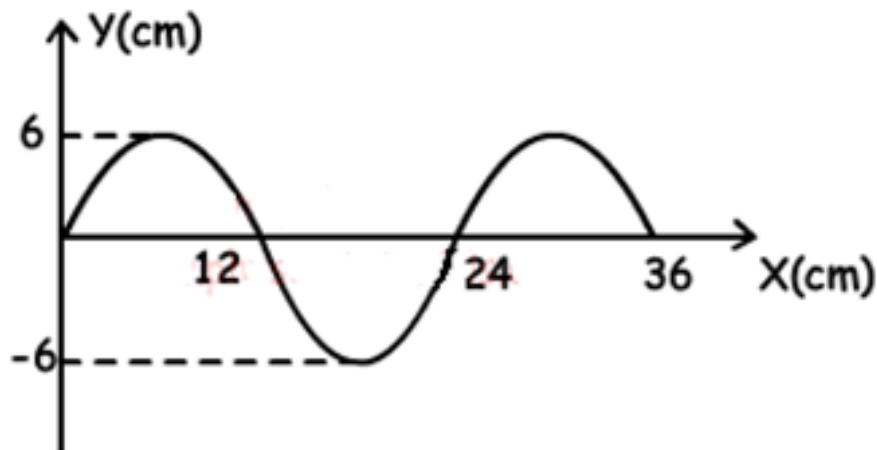
$$\text{wavelength} = \frac{\text{wave speed}}{\text{frequency}} \quad \text{Or} \quad \lambda = \frac{v}{f}$$



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A wave travelling in the positive x direction is showed in the figure. Find the amplitude, wavelength, period, and speed of the wave if it has a frequency (f) of 4 Hz. Find the following.

1)



- Trough (the point with the minimum displacement) is at $y = -6$
- Crest (the point with the maximum displacement) is at $y = +6$
- Amplitude (A) = 6 cm
- Wavelength (λ) = 24 cm
- Period (T) = $\frac{1}{\text{frequency}}$

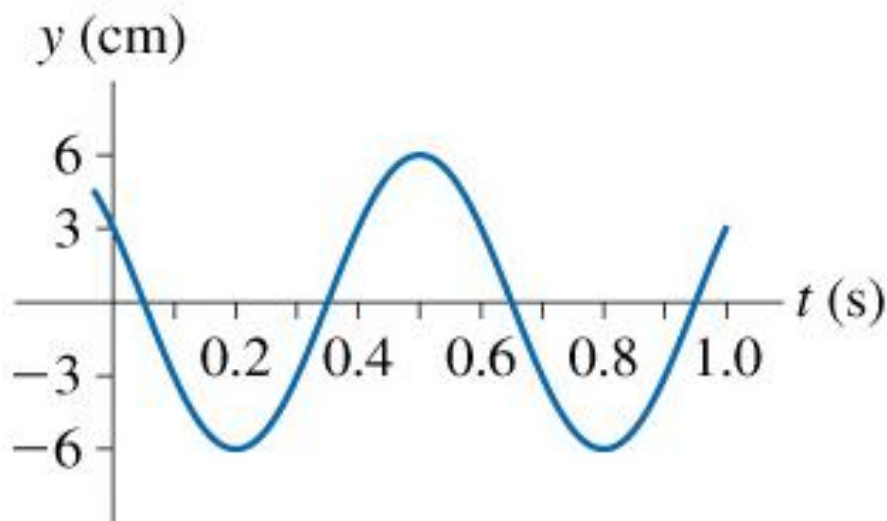
$$\text{Or } T = \frac{1}{f} = \frac{1}{4} = 0.25 \text{ s}$$

- Wave speed = $\text{frequency} \times \text{wavelength}$

$$\text{Or } v = f\lambda = 4 \times 24 = 96 \text{ cm/s}$$

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2) The figure is a history graph at $x = 0$ m of a wave moving to the right at 2 m/s.



- a) What is the amplitude of this wave? **6 cm**
- b) What is the period of this wave? **$T = 0.8 - 0.2 = 0.6$ s**
- c) What is the frequency of this wave?

$$\text{frequency} = \frac{1}{\text{period}}$$

$$\text{Or } f = \frac{1}{T} = \frac{1}{0.6} = 1.67 \text{ Hz}$$

- d) What is the wavelength of this wave?

$$\text{wavelength} = \frac{\text{wave speed}}{\text{frequency}}$$

$$\text{Or } \lambda = \frac{v}{f} = \frac{2}{1.67} = 1.2 \text{ cm}$$

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3) A wave travels in a wave speed of \boxed{v} 200 m/s , its wavelength is $\boxed{\lambda}$ 2 m . Find

a. $frequency = \frac{wave\ speed}{wavelength}$

Or $f = \frac{v}{\lambda} = \frac{200}{2} = 100 \text{ Hz}$

b. $Period (T) = \frac{1}{frequency}$

Or $T = \frac{1}{f} = \frac{1}{100} = 0.01 \text{ s}$

4) A wave travels in a string with frequency of 2 Hz , the wavelength is 0.5 m . Find its wave speed.

$Wave\ speed = frequency \times wavelength$

Or $v = f\lambda = 2 \times 0.5 = 1 \text{ m/s}$

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5) The frequency of a wave in a spring is 4 Hz, and the wave speed is 6 m/s. Find the wave length.

$$\text{wavelength} = \frac{\text{wave speed}}{\text{frequency}}$$

$$\text{Or} \quad \lambda = \frac{v}{f} = \frac{6}{4} = 1.2 \text{ m}$$