

Waves Test Review

Given Equations

$$v = f \lambda$$
$$\beta = 10 \log \frac{I}{I_0}$$

$$I_0 = 10^{-12} \frac{W}{m^2}$$

$$v = 331.5 \frac{m}{s} + 0.6 \frac{m}{s^\circ C} \times T$$

$$c = 3 \times 10^8 \frac{m}{s}$$

$$f' = f_0 \left(\frac{v \pm v_o}{v \pm v_s} \right)$$

$$v = \frac{\Delta d}{\Delta t}$$

$$T = \frac{1}{f}$$

Topics/Terms:

Reflection (fixed/free)

Refraction

Diffraction

Interference (constructive/destructive)

Superposition

Node

Loop

Trough

Crest

Period

Frequency

Wavelength

Amplitude

Hertz

Electromagnetic waves

Medium

Transverse

Longitudinal

Standing wave

Speed of light

Threshold of hearing/pain

Pitch

Intensity

Loudness

Doppler Effect

Beats

Resonance

Sample Problems:

What is the speed of sound in air at 40°C?

What is the speed of light?

What is the perceived frequency of a 730Hz sound if the observer travels away from a stationary source at 30m/s and the air temperature is 0°C?

A train moving at 25m/s blows its whistle at 1650Hz. An observer is running towards the train at 12m/s. What frequency sounds does the observer hear before and after they pass if the air temperature is 20°C?

What is the wavelength of light with a frequency of 3.6×10^{14} Hz?

What is the velocity of a 75 Hz wave with a wavelength of 2.5 mm?

Draw examples of transverse and longitudinal waves.

What happens when two waves hit each other?
What happens after two waves hit each other?

By how many times does the intensity increase when the relative intensity increases by 50 dB?

What is the period of light waves that have a wavelength of 460nm?