1. A string vibrates at a frequency of 20 Hz. What is its period? 1/20 sec.
2. A speaker vibrates at a frequency of 200 Hz. What is its period? 1/200 sec.
3. A swing has a period of 10 seconds. What is its frequency? 1/10 Hz.
4. A pendulum has a period of 0.3 second. What is its frequency? 1/0.3 Hz ≈ 3 Hz
5. You want to describe the harmonic motion of a swing. You find out that it take 2 seconds for the swing to complete one cycle. What is the swing's period and frequency?

   per = 2 sec f = 1/2 Hz
6. An oscillator makes four vibrations in one second. What is its period and frequency?

   FREQ = 4 Hz per = 1/4 sec
7. A pendulum takes 0.5 second to complete one cycle. What is the pendulum's period and frequency?

   per = 0.5 sec FREQ = 1/0.5 = 2 Hz
8. A pendulum takes 10 seconds to swing through 2 complete cycles.
   a. How long does it take to complete one cycle? 5 sec
   b. What is its period? 5 sec.
   c. What is its frequency? 1/5 Hz.
9. An oscillator makes 360 vibrations in 3 minutes.
   a. How many vibrations does it make in one minute? 120
   b. How many vibrations does it make in one second? 2
   c. What is its period in seconds? 1/2 sec.
   d. What is its frequency in hertz? 2 Hz

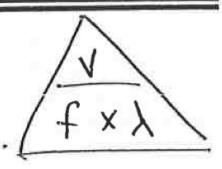
6/5/15 - DO ONLY #1-4

NAME

Math Skills

Wave Speed

$v = f\lambda$



1. A wave with a frequency of 60.0 Hz travels through vulcanized rubber with a wavelength of 0.90 m. What is the speed of this wave?

$v = f\lambda = 60.0\ Hz \cdot 0.90\ m = 54\ m/s$

2. A wave with a frequency of 60.0 Hz travels through steel with a wavelength of 85.5 m. What is the speed of this wave?

$v = f\lambda = 60.0\ Hz \cdot 85.5\ m = 5130\ m/s$

3. The lowest pitch that the average human can hear has a frequency of 20.0 Hz. If sound with this frequency travels through air with a speed of 331 m/s, what is its wavelength?

$\lambda = \frac{v}{f} = \frac{331\ m/s}{20.0\ Hz} = 16.6\ m$

4. One of the largest organ pipes is in the auditorium organ in the convention hall in Atlantic City, New Jersey. The pipe is 38.6 ft long and produces a sound with a wavelength of about 10.6 m. If the speed of sound in air is 346 m/s, what is the frequency of this sound?

$f = \frac{v}{\lambda} = \frac{346\ m/s}{10.6\ m} = 32.6\ Hz$

5. A certain FM radio station broadcasts electromagnetic waves at a frequency of 9.05×10^7 Hz. These radio waves travel at a speed of 3.00×10^8 m/s. What is the wavelength of these radio waves?