DO NOT WRITE ON THIS PAPER

Period, Frequency, Wavelength, and Wave Speed Practice

Directions: Show all necessary work and steps on a separate sheet of paper. EM waves (radio, micro, x ray, UV, visible,

infrared) travel at the speed of light: 3 x 10⁸ m/s. Sound waves travel at 340 m/s (unless said otherwise).

Frequency= <u>Cycles</u>

Sec Period= <u>Sec</u>

Cycles



Period and Frequency

- 1) A swing has a period of 3 seconds. What is its frequency? (0.33 Hz)
- 2) A bouncing basketball has a period of 0.7 seconds. What is its frequency? (1.43 Hz)
- 3) A TV has a refresh frequency of 60 Hz. What is its period? (0.016 s)
- 4) A clock ticks 3 times every 5 seconds. What is its frequency? Period? (0.6 Hz, 1.67 s)
- 5) A man exercising can do 15 pushups in 20 seconds. What is his frequency? Period? (0.75 Hz, 1.33 s)
- 6) If 10 waves hit a dock every 16 seconds, what is the period and frequency of each wave? (1.6 s, 0.625 Hz)

Wave speed, wavelength, frequency

- 7) If the waves from the previous problem (#6) are 10 meters apart, what is the speed of each wave? (6.25 m/s)
- 8) Red light has longer wavelength than violet light. Which has greater frequency? Explain. (violet, explain)
- 9) What is the velocity of a wave with a frequency of 760 Hz and a wavelength of .45 m? (342 m/s)
- 10) What is the wavelength of a sound wave with a frequency of 50 Hz? (Speed of sound is 342 m/s) (6.84 m)
- 11) Waves in a lake are 6 m apart and pass a raft every 2 s. What is the speed of the waves? (3 m/s)
- 12) What is the frequency of a pendulum that is moving at 30 m/s with a wavelength of .35 m? (85.71 Hz)
- 13) A wave with a frequency of 60 Hz travels through rubber with a wavelength of 0.9 m. What is the speed of the wave? (54 m/s)
- 14) What is the wavelength of a sound wave moving at 340 m/s with a frequency of 256 Hz? (1.33 m)
- 15) A wave in a string has a wavelength of 0.10 m and a frequency of 7 Hz. Calculate the speed of the wave. (0.7 m/s)
- 16) A sound wave in a steel rail has a frequency of 620 Hz and a wavelength of 10.5 m. What is the speed of sound in steel?(651 m/s)
- 17) A wave on a guitar string travels at a speed of 200 m/s. Calculate the wavelength of an "A" note at 440 Hz. (0.45 m)
- 18) Determine the frequency of a microwave (which travels at the speed of light) that is 0.06 m in length. $(5 \times 10^9 \text{ Hz})$
- 19) A wave generator produces 10 wave pulses per second. If the speed of each wave is 3 m/s, what is the length of each wave? (0.3m)
- 20) A buoy bobs in the ocean from waves that are 2.5 m apart passing the buoy at 4 m/s. What is the frequency of the waves?(1.6 Hz)
- 21) A low frequency radio wave has a frequency of 250,000 Hz. What is its wavelength? (12,000 m)
- 22) A certain wave in the EM spectrum has a frequency of 2 x 10^{12} Hz. What is its wavelength? (1.5x $10^{-4}m$)
- 23) Cicadas (bugs) produce a buzzing sound with a wavelength of 2.69 m. Through air they travel at 346 m/s. What is the frequency of the sound they produce? What is its period? (128.62 Hz, 0.0077 s)
- 24) An earthquake generates very low frequency shock waves (about 0.050 Hz). If they travel at 8000 m/s, what is their wavelength? (16,000 m)
- 25) What is the relationship between frequency and wavelength? What does that mean? (inversely proportional, explain)