

Waves

Frequency and Period: $f = \frac{1}{T}$

| | |
|-----------|---|
| 80.0 Hz | 1. A wave passes every 0.0125 seconds. What is the frequency with which waves pass? |
| 0.00382 s | 2. Middle C is 261.6 Hz. What is its period? |
| 10. Hz | 3. What is the frequency of a wave that has a period of 0.10 seconds? |
| 0.37 Hz | 4. An earthquake wave has a period of 2.7 seconds. What is its frequency? |

Velocity, Frequency, and Wavelength: $v = f\lambda$ (looks like $c = f\lambda$ in the data packet)

| | |
|--------------------------|---|
| 5400 m/s | 5. What is the velocity of an earthquake wave that has a frequency of 12 Hz, and a wavelength of 450 m? |
| 2540 Hz | 6. What is the frequency of a sound wave ($v = 343$ m/s) that is 0.135 m long? |
| 3.28 m | 7. What is the wavelength of a, 91.5×10^6 Hz (91.5 MHz) radio wave? ($v = c = 3.00 \times 10^8$ m/s) |
| 3.3 m/s | 8. What is the velocity of ocean waves if they have a wavelength of 13.2 meters, and a frequency of 0.25 Hz? |
| 2.6 Hz | 9. What is the frequency that 16 m long boxcars pass a crossing when the train is going 42 m/s? |
| 1.31 m | 10. What is the wavelength of a sound wave with a frequency of 261.6 Hz? ($v = 343$ m/s) |
| 7.14×10^{14} Hz | 11. What is the frequency of a 420. nm ($420. \times 10^{-9}$ m) light wave? ($v = c = 3.00 \times 10^8$ m/s) |

Velocity, Frequency, Period and Wavelength: $f = \frac{1}{T}$ $v = f\lambda$ so $v = \frac{\lambda}{T}$

| | |
|---|---|
| 72.5 m/s | 12. What is the speed of a wave with a wavelength of 14.5 m, and a period of 0.20 s? |
| 0.012 s | 13. What is the period of a 4.2 m wavelength sound wave? ($v = 343$ m/s) |
| 3.0×10^8 m/s | 14. What is the speed of a wave with a wavelength of 150 m, and a period of $0.50 \mu\text{s}$ (0.50×10^{-6} s)? |
| 3.33×10^{-10} s 3.0×10^9 Hz (3.0 GHz) | 15. What is the period of an electromagnetic wave with a wavelength of 0.10 m? ($v = c = 3.00 \times 10^8$ m/s) What is the frequency? |