

Chapter 25-27 Practice Problems

1. The church bells ring at a frequency of 882.1 Hz. Scott is driving by the church on his Harley one day. If he is driving away from the church at 25.9 m/s when the bells start chiming, what frequency does Scott hear the bells ringing? **815 Hz**
2. During an afternoon thunderstorm, while looking out the window, you see a lightning strike and then 4.50 seconds later hear its thunder clap. How far away from your window did the lightning strike? **1530 m**
3. An Atlantic ocean wave has a length of 10.0 m. The wave passes a fixed point every 2.00 s. What is the speed of the wave? **5.00 m/s**
4. What is the length of a pendulum that has a period of 1.75 s? **.761 m**
5. Kidd Kraddick in the morning is found on the radio at a frequency of 1.061×10^8 (106.1 MHz). What wavelength does this frequency correlate to? **2.83 m**
6. My Queen CD spins at 350. rpm (revolutions per minute). What is the period and frequency of the CD?
 $f = 5.83 \text{ s}^{-1}$ $T = .172 \text{ s}$
7. Yellow light has a wavelength of 6.00×10^{-7} m, what is the frequency of yellow light? **$5.00 \times 10^{14} \text{ Hz}$**
8. Calculate the wavelength of radiation emitted from radioactive cobalt with a frequency of $2.80 \times 10^{20} \text{ s}^{-1}$.
 $1.07 \times 10^{-12} \text{ m}$
9. Raymone who has a mass of 80.0-kg loves to jump up and down on his trampoline, which has a force constant of 4670 N/m. What is the period of his jumping? **.822 s**
10. When a force of 132 N is applied to the top of a vertical spring, the spring compresses 5.93 cm. Find the force constant of the spring. **2230 N/m**
11. A person lying on an air mattress in the ocean rises and falls through one complete cycle every five seconds. The crests of the wave causing the motion are 20.0 m apart. What is the frequency and what is the speed of the wave? **$f = .200 \text{ Hz}$ $v = 4.00 \text{ m/s}$**
12. Barney, a bumblebee flying at 6.00 m/s, is being chased by Betsy, a bumblebee who is flying at 4.00 m/s. Barney's wings beat with a frequency of 90.0 Hz. What frequency does Betsy hear as she flies after Barney?
89.5 Hz
13. A jack-in-the-box lid will pop open when a crank is turned on the outside of the box. If Jack pushes against the inside of the box with a force of 3.00 N when the lid is closed, and the spring is compressed 10.0 cm from equilibrium, what is the force constant of the spring? **30.0 N/m**