## Additional Exercises

| A-1: | Find the wavelength of the ultrasonic wave emitted by a bat if it has a |
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| frequency of $4.0 \times 10^{4} \mathrm{~Hz}$. |  |
| A-2: | Radio station KSON in San Diego broadcasts at both $1240 \mathrm{kHz}(\mathrm{AM})$ and 97.3 |
| MHz (FM). a) Which of these signals, AM or FM, has the longer wavelength? |  |
| b) How long is each? |  |
| A-3: | What is the wavelength of a B note (frequency 494 Hz ) played a) by a flute? |
| b) If the flute and a sax play the same note, which of the following will be |  |
| different: quality, pitch, or loudness? |  |
| A-4: | As an anchor is being hoisted out of the water, it hits the hull of the ship, <br> causing the anchor to vibrate with a frequency of 150 . Hz. If the speed of <br> sound in sea water is 1520 m/s, how many wavelengths of sound will fit <br> between the boat and the ocean bottom 395 m below? |
| A popular pastime at sporting events is "the wave," a phenomenon where |  |
| individuals in the crowd stand up and sit down in sequence, causing a giant |  |
| ripple of people. If a continuous "wave" passes through a stadium of people |  |
| with a speed of 20 m/s and a frequency of 0.5 Hz, what is the distance from |  |
| "crest" to "crest" (in other words, the wavelength of the wave)? |  |
| A-6: | From his bedroom, Garth can hear the distant sound of a train horn as the |
| train travels through the mountains on its way from Chattanooga to |  |



> A1. 0.0085 m
> A3. a) 0.688 m
> A5. 40 m
> A7. a) Toward: 501.5 Hz Away: 498.5 Hz
> b) 3.0 Hz
> A9. $15.0 \mathrm{~m} / \mathrm{s}$
> A11. $20.4 \mathrm{~m} / \mathrm{s}$
> A15. $628 \mathrm{~m} / \mathrm{s}$

