1. Answer the following questions comparing sound and EM waves:

   (a) If you have an audible sound wave and an EM wave, which of the following three options is the most likely? A. They have the same wave speed, B. They have the same wavelength, or C. They have the same frequency.

   (b) For your answer in part (a), give an approximate numerical value (for example, if you said the speed is probably the same, give a rough idea what that wave speed is). For the EM wave, what part of the EM spectrum does this wave belong to?

2. Suppose an EM wave travels from air into water. What happens to the wave’s speed, wavelength, and frequency? (you don’t need much of an explanation for this one – just the answer is okay.)

3. Take a look at the following figure from the textbook:

   ![Figure 16.27](image)

   (a) What is the approximate phase difference between $x_1$ and $x_2$? You answer should be a numerical answer in either degrees or radians.

   (b) The graph (a snapshot graph, since $t$ is some fixed, constant value, like in a photograph) can be described by the equation $D(x) = A \cos(kx + \phi_0)$, where $|\phi_0| \approx 45^\circ = \pi/4$. Is $\phi_0$ positive or negative? Explain as though you were teaching math to a high school student.

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[not due; for extra practice]. All problems from Chapter 16 of the 4th edition of Knight:


Exercises: 20, 22, 25, 26, 29-32.