Physics 121 – November 30, 2017

Announcements:

- Final exam on Thursday, Dec 14 at 9:00 AM in Workman 101
- Review on Dec 7 (last class meeting)

Assignments:

- Finish reading Chapter 16.
- Complete ETA Problem Set #15 (last one!) by Monday, Dec 4.
- End-of-chapter problems: Ch 16: 70, 71, 81, 87, 98, 102, and 114. Due by 4 pm, Dec 4.
- Recitation practice problems 69, 82, 97, 103, and 106

Tips for Chapter 16 HW

- #81: Assume that the ocean wave velocity and wavelength remain constant.
- #87: Change the clause, “the intensity ~~at the source~~ is I_1 at a distance of one meter from the source” .
- #114: You want to find the smallest overtone frequency that is greater than 100 Hz.

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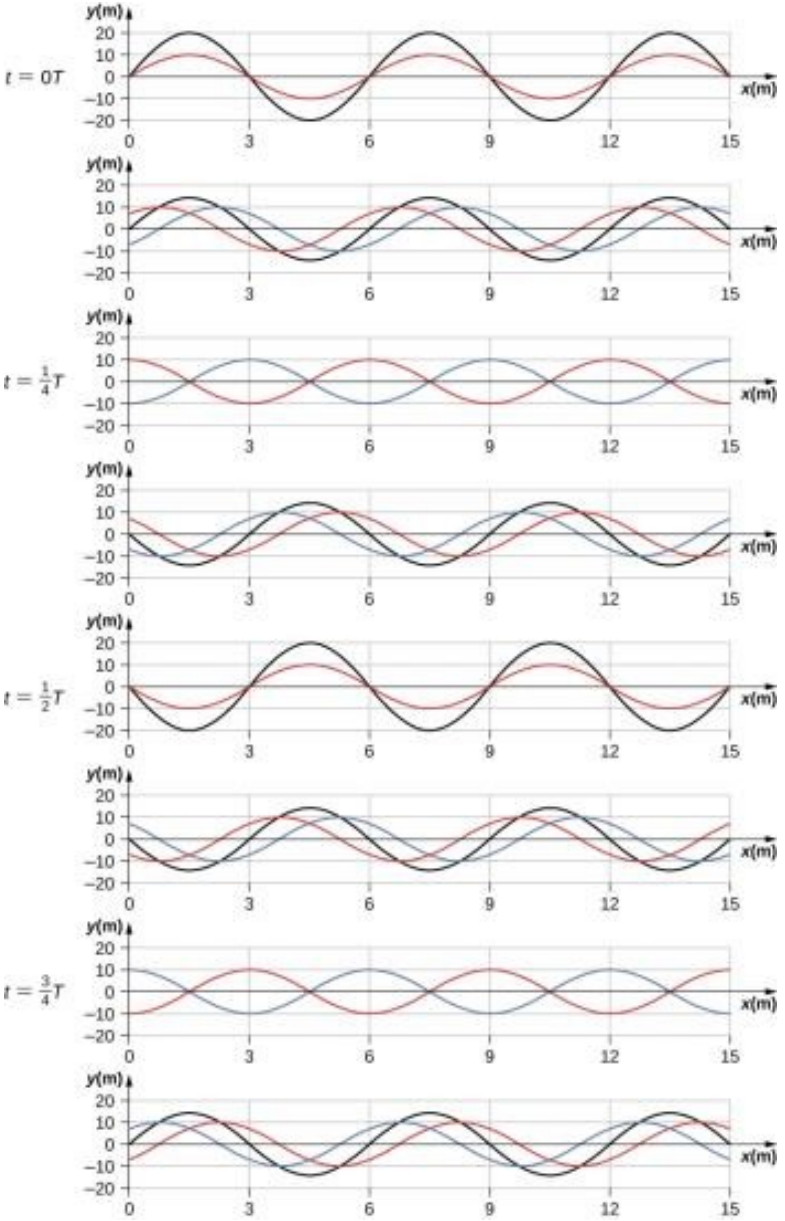
- #87: Change the clause, "the intensity ~~at the source~~ is I_1 at a distance of one meter from the source" .
- #114: You want to find the smallest overtone frequency that is greater than 100 Hz.

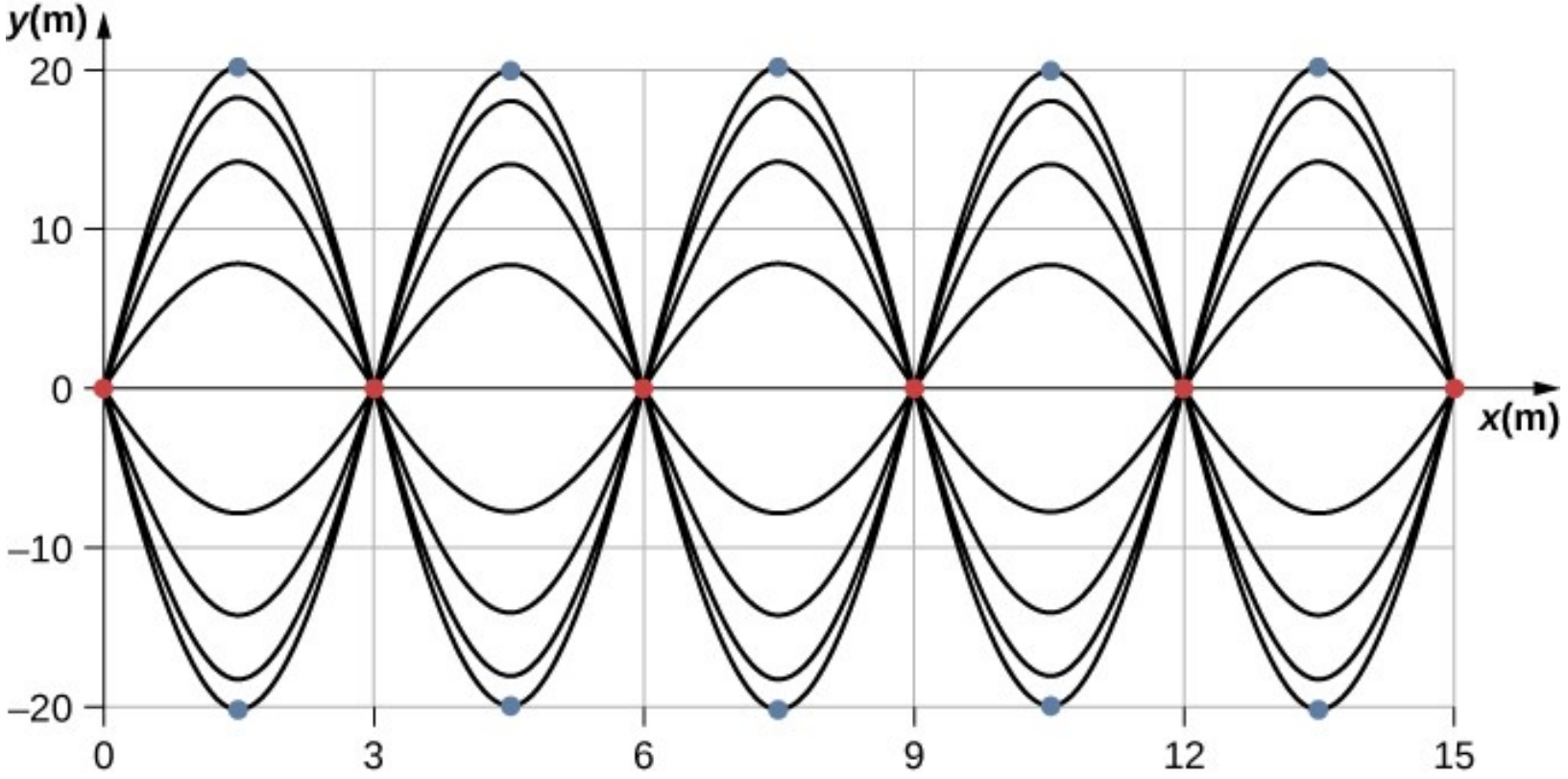
114. The frequencies of two successive modes of standing waves on a string are 258.36 Hz and 301.42 Hz. What is the next frequency above 100.00 Hz that would produce a standing wave?

Figure 16.26



Time snapshots of two sine waves. The red wave is moving in the $-x$-direction and the blue wave is moving in the $+x$-direction. The resulting wave is shown in black. Consider the resultant wave at the points $x = 0$ m, 3 m, 6 m, 9 m, 12 m, 15 m and notice that the resultant wave always equals zero at these points, no matter what the time is. These points are known as fixed points (nodes). In between each two nodes is an antinode, a place where the medium oscillates with an amplitude equal to the sum of the amplitudes of the individual waves.

Figure 16.27



When two identical waves are moving in opposite directions, the resultant wave is a standing wave. Nodes appear at integer multiples of half wavelengths. Antinodes appear at odd multiples of quarter wavelengths, where they oscillate between $y = \pm A$. The nodes are marked with red dots and the antinodes are marked with blue dots.

For the demo “standing waves on a string”, we used a hanging mass of 250 g and observed a fundamental frequency of f_1 . What fundamental frequency would we measure if the mass was increased to 500 g?

A. $2f_1$

B. $f_1/2$

C. $(2)^{1/2}f_1$

D. f_1