1. Solve Prob. 20, Ch. 16 in Ohanian's "Physics" which starts as:

   The end of a long string of mass per unit length μ is knotted to the beginning of another long string of mass per unit length $\mu 2$ ...

2. Consider a tube of length L open at both ends. Show that the eigen-frequencies in this tube are

$$\nu_n = n\frac{v}{2L}$$

   Draw diagrams showing the displacement amplitude for each of the first four standing waves.
   (Ohanian "Physics", Ch. 17, Prob 22)

3. Consider a fixed sound source which emits a sound of wavelength λ. Consider an observer which travels at a constant speed v. The line of motion of the observer does not pass through the sound source, but is passes a distance d away. What is the wavelength of observer observes when he is $\sqrt{d^2 + R^2}$ meter away from the source and approaching the source. (Let v_s denote the speed of sound)

4. In the open see, where the depth h of of the water is large, the amplitude of a tsunami is small; but when the tsunami enters the coastal shallows, where h is small, the amplitude becomes large.

   Show that the amplitude varies as $A \propto 1/h^{1/4}$. (Hint: as in the case of a wave on a string, the power carried bya tsunami is proportional to $v\omega^2 A^2$. Assume that the power int he wave remains constant as it enters the coastal shallows; also note that the frequency remains constant)

   Suppose that a tsunami has an amplitude of 35 cm when in the open sea, where $h = 4.3$ km. If this wavereaches a coastal region where $h = 10$ m what will be its amplitude? Its height from trough to crest? (Ohanian, "Physics", Ch 17, Prob. 50)