IB Physics
FA12.1 - Standing Waves

Name_____

Foreign Language Name_____

Show your work, and circle your answers and use sig figs to receive full credit.

1-3. A guitar string has a length of 64.5 cm, and a fundamental frequency of 110. Hz.

1. Draw the first three harmonics of vibration on the string below, and calculate the wavelength and frequency for each.

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2. What is the velocity of the waves on this string?

3. If this string is fingered 21.5 cm from one end (it is shortened by that amount). What is the frequency of the fundamental now?

4. Calculate the missing quantity below. "L" is the length of the waveform (the picture), λ is the wavelength of the wave.

 L = 45 cm, λ = ?	 L = 2.67 m, λ = ?	 λ = 1.20 m, L =	 λ = 3.43 m, L =

5. Draw the second possible harmonic (The second lowest tone it can make.) of a one end fixed, one end open pipe. Calculate the frequency of this mode if the pipe is 13.2 cm long, and the speed of sound in the pipe is 317 m/s.