HW 12-2 Soln)

The frequencies for such a system (both ends the same) are given by

$$f_n = \frac{nv}{4L} \quad n = 2, 4, 6, 8, \ldots \ .$$

Applied to this situation, we have

$$f_n = \frac{nv}{4L}$$

for one harmonic and

$$f_{n+2} = \frac{(n+2)v}{4L}$$

for the other. Remember that the n advances by <u>two</u> each time.

Subtract:

$$f_{n+2} - f_n = \frac{(n+2)v}{4L} - \frac{nv}{4L}$$

$$f_{n+2} - f_n = \frac{2v}{4L} = \frac{v}{2L}$$

$$v = 2L(f_{n+2} - f_n) = \ 2(2)(480 - 400) = 320 \text{ m/s}$$