Name: Key

Date:

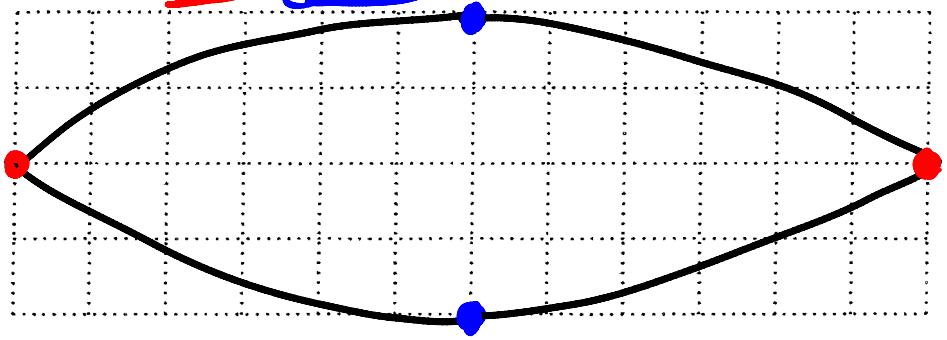
Section C D F

The Masters School
Mr. Alex Rawson
Physics

Waves II: Standing Waves

STANDING WAVES: **A** string is stretched between the two points shown. Waves travel along the string **at** a speed of 48 **cm/s.** Each grid block represents **1 cm.** Draw the standing wave described, label the nodes and antinodes on it, and answer the questions pertaining to it.

1. (a) Draw the longest possible standing wave on this string with an amplitude of 2 cm. Label its nodes and antinodes.



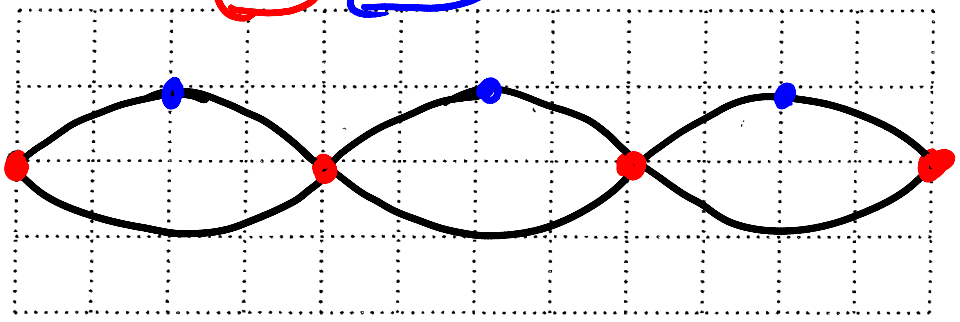
(b) What is the wavelength of this wave?

$\lambda = 2L = 2(12) = 24\ cm = .24\ m$

(c) What is the frequency of this wave?

$V = f\lambda \qquad f = \frac{V}{\lambda} = \frac{48\ cm/s}{24\ cm} = 2\ Hz$

2. (a) Draw a standing wave for the third harmonic on this string with an amplitude of 1 cm. Label its nodes and antinodes.



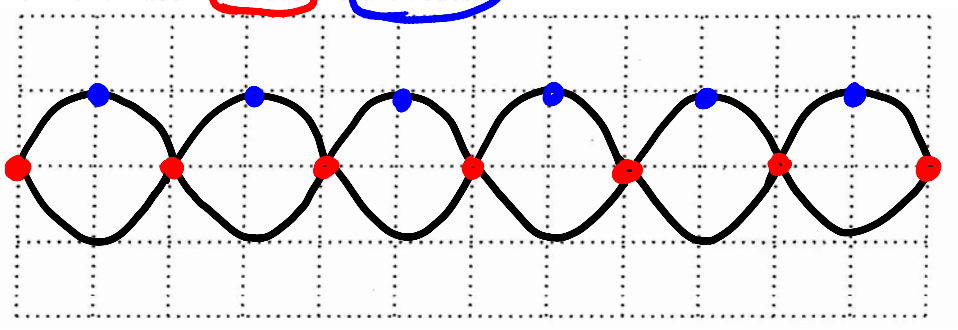
(b) What is the wavelength of this wave?

$\lambda = \frac{2}{3}L = 8\ cm$

(c) What is the frequency of this wave?

$V = f\lambda \qquad f = \frac{V}{\lambda} = \frac{48\ cm/s}{8} = 6\ Hz$

3. (a) Draw a standing wave for the sixth harmonic on this string with an amplitude of 1 cm. Label its nodes and antinodes.



(b) What is the wavelength of this wave?

$\lambda = \frac{1}{3} L = 4 \text{ cm}$

(c) What is the frequency of this wave?

$v = f \cdot \lambda \qquad f = \frac{v}{\lambda} = \frac{48}{4} = 12 \text{ Hz}$