

superposition

<http://www.phy.ntnu.edu.tw/ntnujava/viewtopic.php?t=34&sid=653764f2e28287f4736699cc8efd6719>

good!



(can use mouse to stop and invert)

<http://www.kettering.edu/~drussell/Demos/superposition/superposition.html>



(good intro demo)

Principle of Superposition

"When two waves exist at the same time in the same space in a medium."

- 1) Each wave pushes on the particles of the medium.
- 2) As the waves interact they temporarily change the medium they're acting on.
- 3) After the waves pass through the medium it returns to its original state. The waves continue unaffected too.

Principle of Superposition

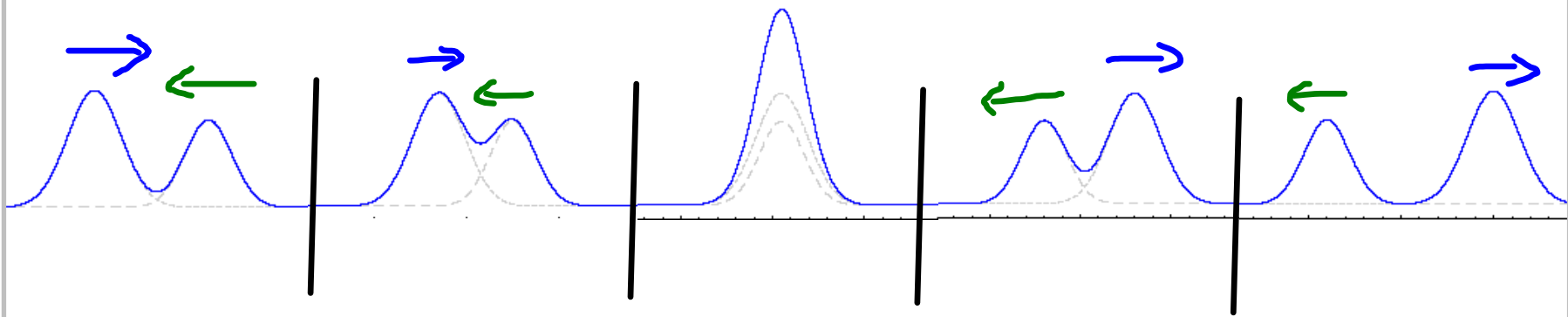
"When two waves exist at the same time in the same space in a medium."

The result of the interaction is called:

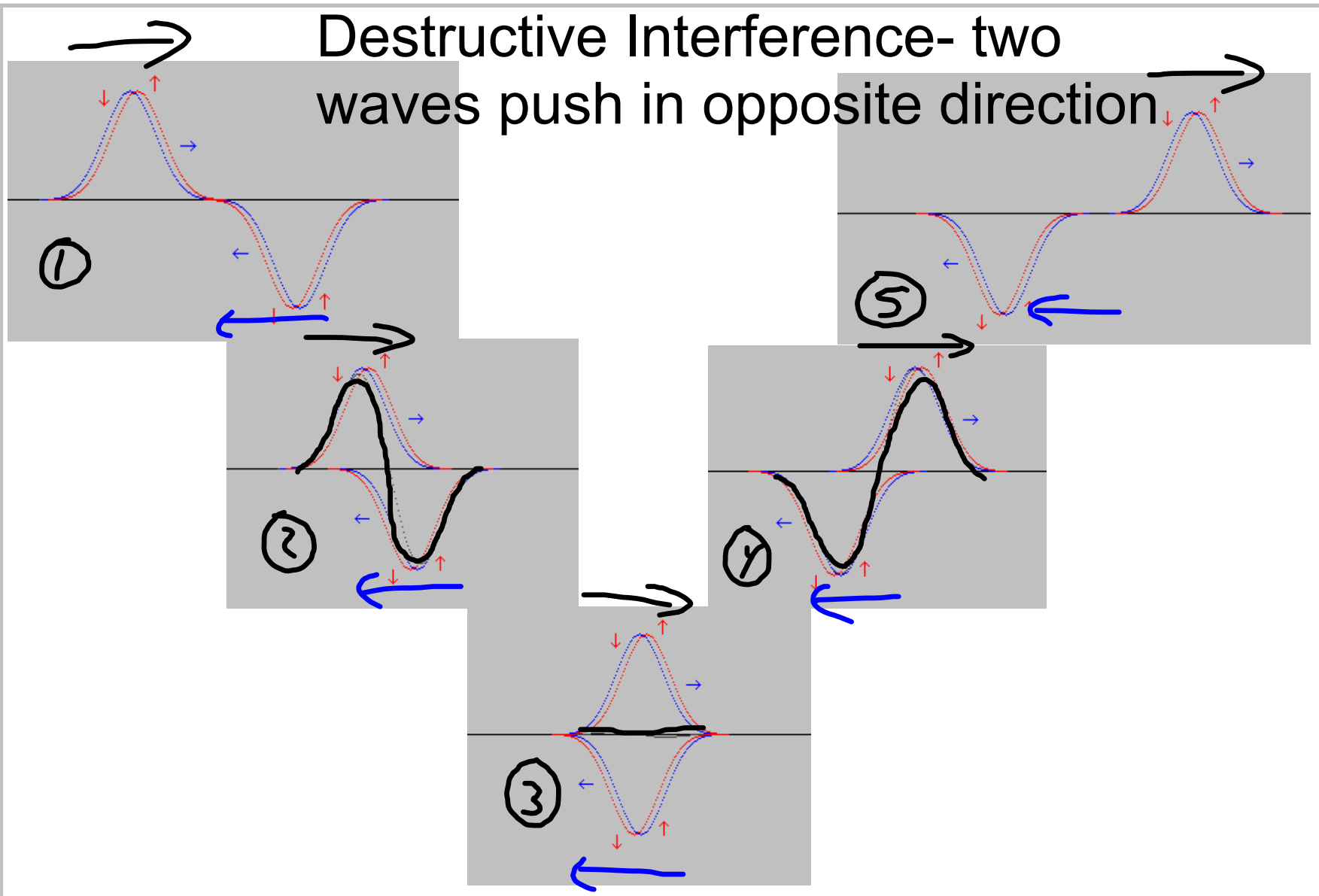
Constructive Interference- two waves push in the same direction

Destructive Interference- two waves push in opposite direction

Constructive Interference- two waves push in the same direction



Destructive Interference- two waves push in opposite direction



standing waves (mult. loops)

(intro) <http://www.walter-fendt.de/ph14e/stwaverefl.htm>

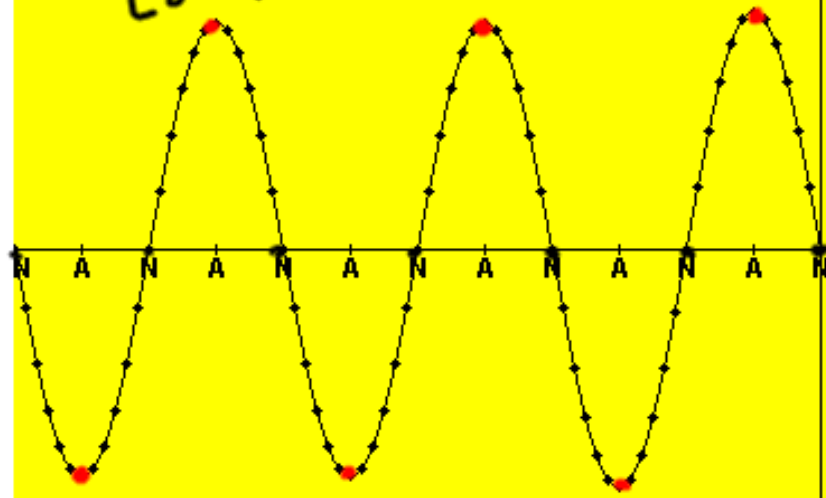
shows incident/reflected, and standing wave

<http://www.ngsir.netfirms.com/englishhtm/TwaveStatA.htm>

<http://physics.usask.ca/~hirose/ep225/animation/standing1/anim-stwave1.htm>

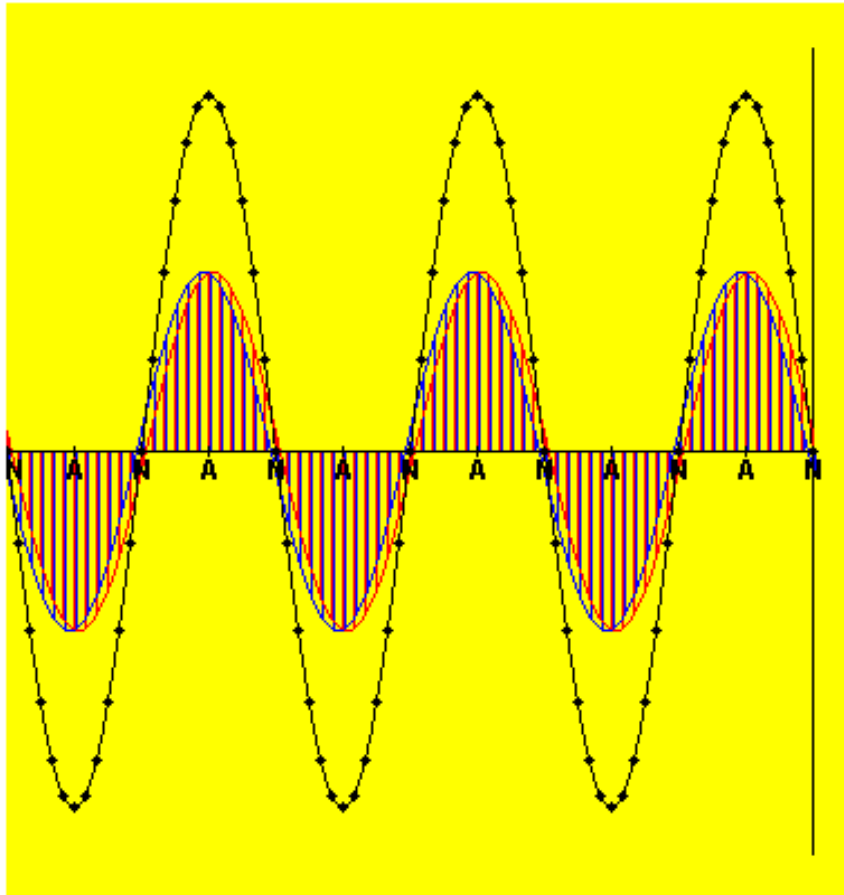
(shows 1st - 3rd harmonics)

Standing wave
Loop

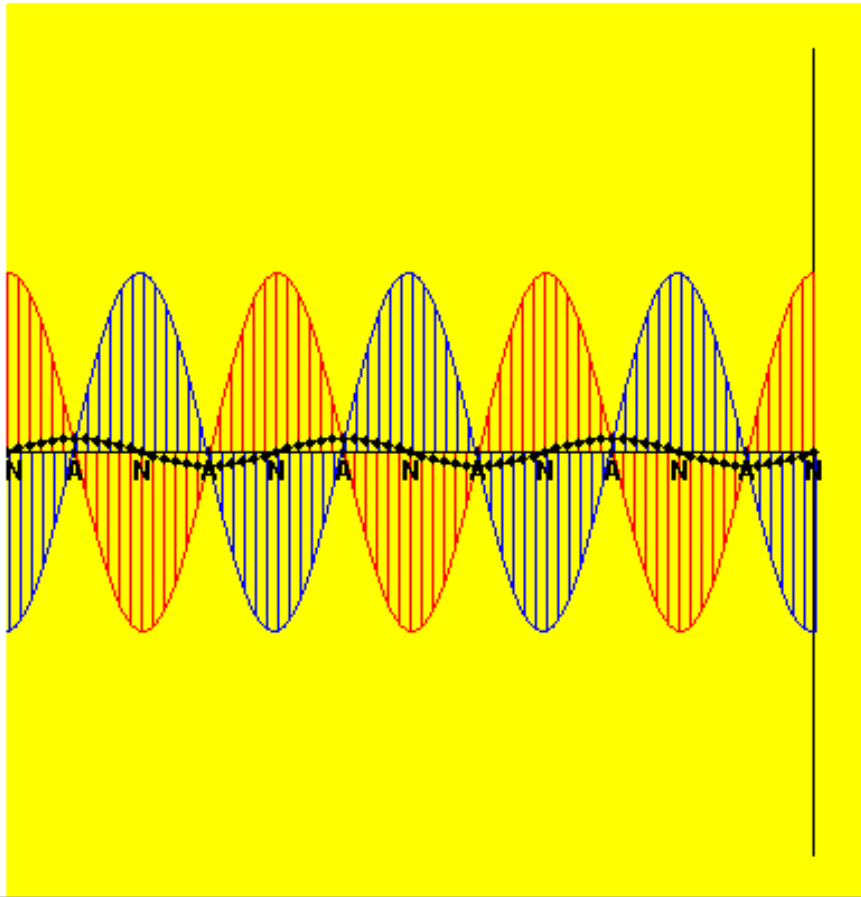


N = Node - no displacement

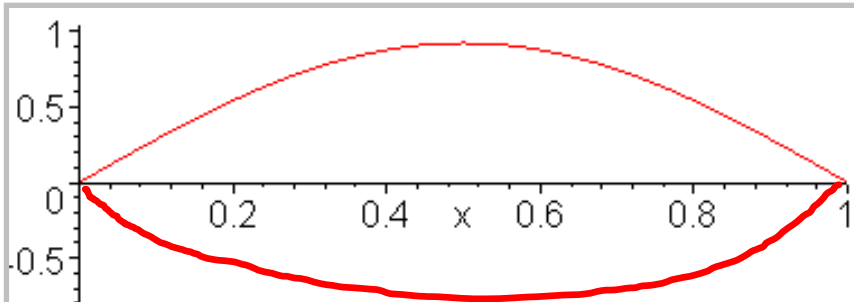
A = antinode - max. displacement



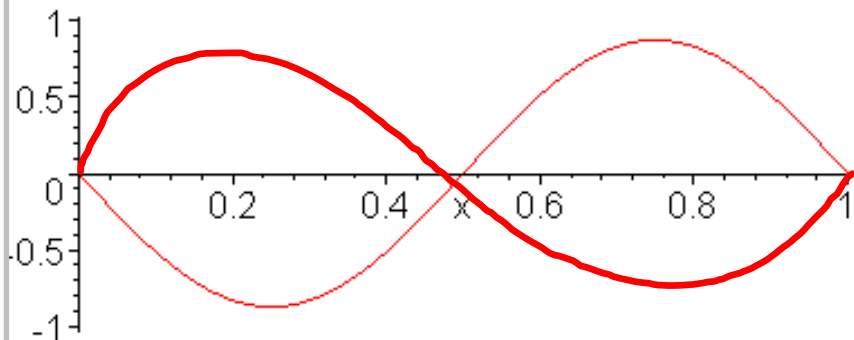
inlet SWelleRefl started



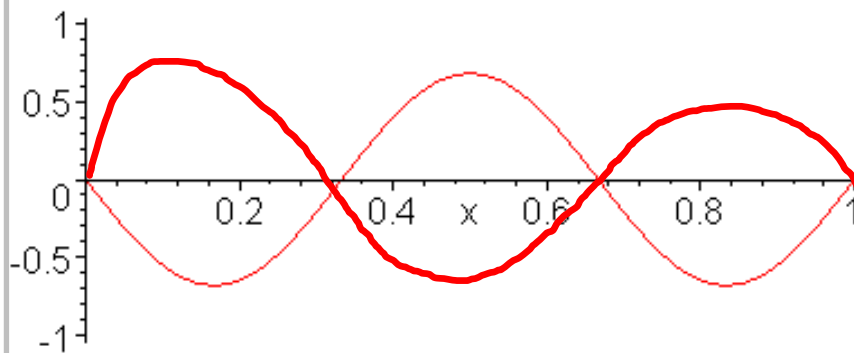
StWelleRef1 started



Fundamental Frequency
first harmonic

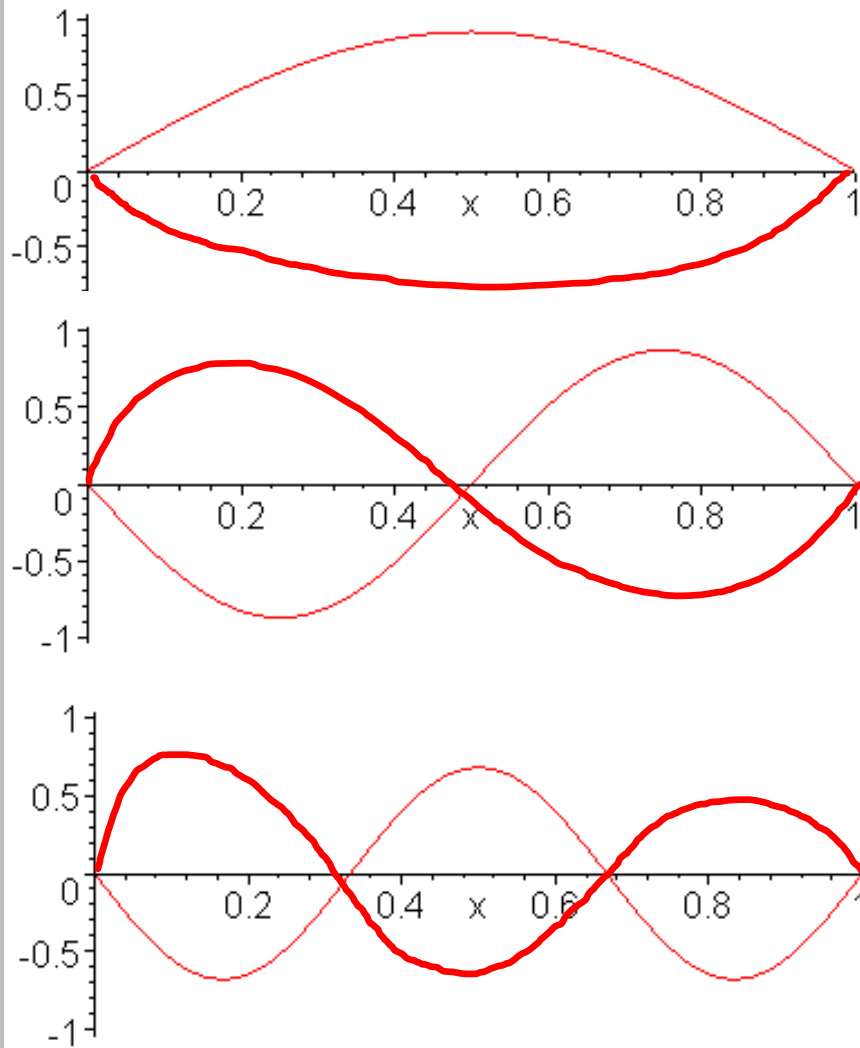


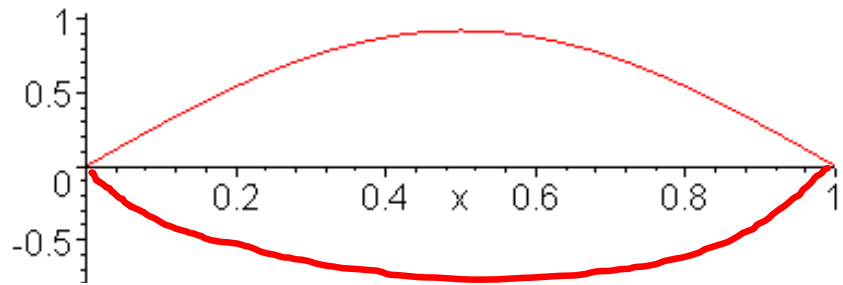
second harmonic



third harmonic

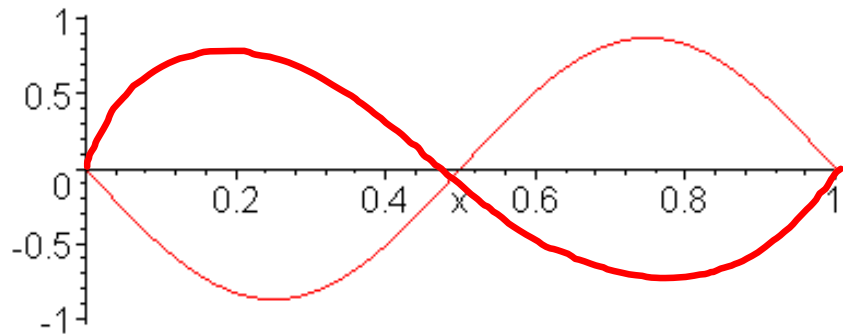
What part of the wave is in each medium?





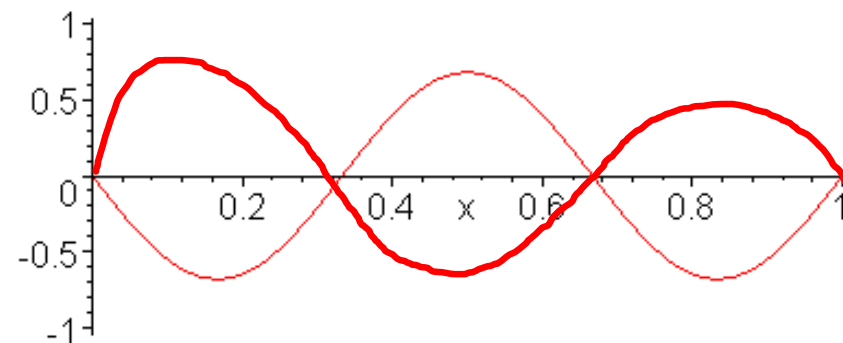
$$L = 1/2 \lambda \quad \text{or, } \lambda = 2/1 L$$

$$\lambda =$$



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$$\lambda =$$

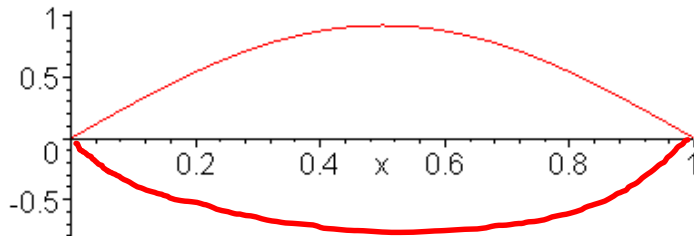


$$L = 3/2 \lambda \quad \text{or, } \lambda = 2/3 L$$

$$\lambda =$$

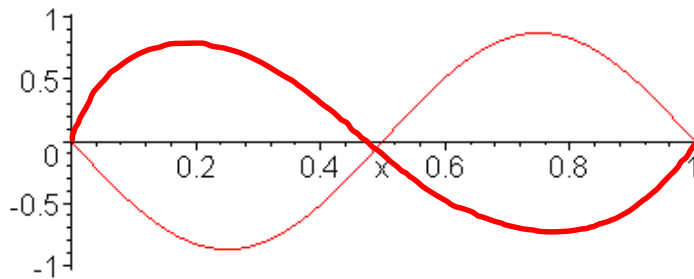
What do all the " λ " equations have in common?

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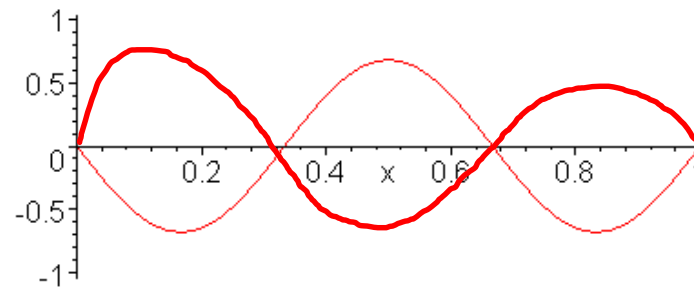
Fundamental Frequency
first harmonic

$$\lambda = 2/1 L$$



second harmonic

$$\lambda = 2/2 L$$



third harmonic

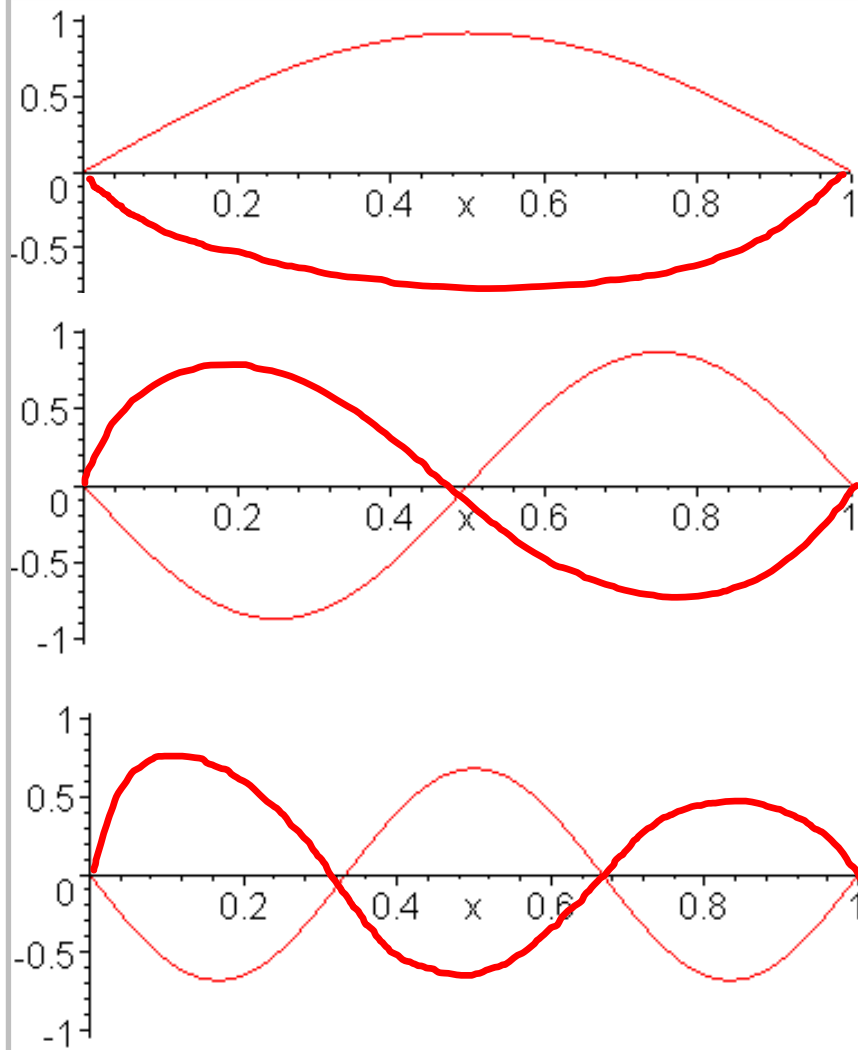
$$\lambda = 2/3 L$$



$$\lambda = 2L/n$$

"n" stands for the # harmonic you're dealing with

Velocity, Frequency, wavelength



doppler effect

 <http://www.phy.ntnu.edu.tw/ntnujava/viewtopic.php?t=38>

good intro

 <http://www.kettering.edu/~drussell/Demos/doppler/doppler.html>

shows different source speeds

