

- ⇒ The distance between two successive nodes in a vibrating string is  $\frac{1}{2}\lambda$
- ⇒ The point of maximum displacement from a node is  $\frac{1}{4}\lambda$

## Examples

1. What is the wave speed of a standing wave containing 2.5 waves in 50 cm and waves are created 62 times each second?

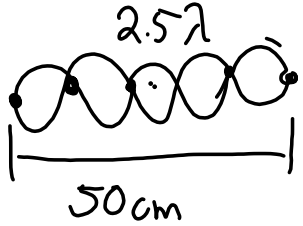


Diagram showing a standing wave with 2.5 wavelengths in a 50 cm length. The total length is labeled as  $50\text{ cm}$  and the number of wavelengths is labeled as  $2.5\lambda$ .

$$2.5\lambda = 50$$

$$\lambda = \frac{50}{2.5}$$

$$\lambda = 20\text{ cm}$$

$$f = 62\text{ Hz}$$

$$v = f\lambda$$

$$= (62)(20)$$

$$v = 1240\text{ cm/s}$$

2. A standing wave pattern contains 8 nodes (with a node at the beginning and end) The distance between the second and 6th node 70 cm. The wave speed is 102 cm/s. What is the frequency of the traveling waves?

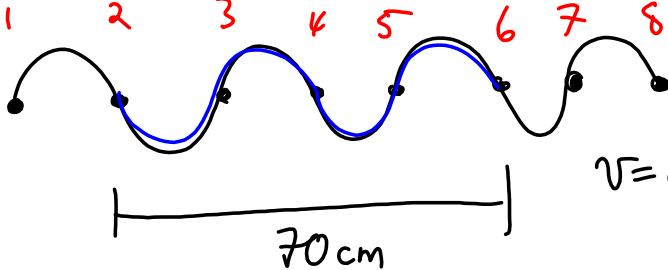


Diagram showing a standing wave with 8 nodes labeled 1 through 8. The distance between the 2nd and 6th nodes is labeled as  $70\text{ cm}$ . The wave speed is given as  $v = 102\text{ cm/s}$ .

contains 2 waves

$$2\lambda = 70$$

$$\lambda = 35\text{ cm}$$

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$$v = f\lambda$$

$$102 = f(35)$$

$$\frac{102}{35} = f$$

$$2.9\text{ Hz} = f$$