

3 Stationary waves with strings

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$L = 2$ $v = 40 \text{ m/s}$

① Fundamental frequency
 $\frac{1}{2}\lambda = 2$
 $\lambda = 4 \text{ m}$
 $f = \frac{40}{4} = 10 \text{ Hz}$

② First Overtone
 $1\lambda = 2$
 $\lambda = 2 \text{ m}$
 $f = \frac{40}{2} = 20 \text{ Hz}$

③ Second Overtone
 $1.5\lambda = 2 \text{ m}$
 $\frac{3}{2}\lambda = 2$
 $\lambda = \frac{4}{3}$
 $f = \frac{40}{\frac{4}{3}} = 30 \text{ Hz}$

④ Third Overtone
 $2\lambda = 2$
 $\lambda = 1 \text{ m}$
 $f = \frac{40}{1} = 40 \text{ Hz}$

Node to Node = $\frac{1}{2}\lambda$ *

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