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(53) string, $L = \frac{\lambda}{2}$ $f = 294 \text{ Hz}$

$$v = f\lambda$$

$$v_1 = (294 \text{ Hz})(2L)$$

new length $\frac{2L}{3}$

so $\frac{2L}{3} = \frac{\lambda}{2}$ $f = ?$

$$\lambda = \frac{4L}{3}$$

$$v_2 = (f)\left(\frac{4L}{3}\right)$$

but $v_1 = v_2$ (same string, same speed)

$$(294 \text{ Hz})(2L) = f\left(\frac{4L}{3}\right)$$

$$f = \underline{441 \text{ Hz}}$$

(55) nodes are $\frac{\lambda}{2}$ apart

$$v = f\lambda$$

$$\lambda = \frac{v}{f} = \frac{92 \text{ ms}^{-1}}{475 \text{ Hz}} = 0.194 \text{ m}$$

so nodes are $\underline{9.7 \times 10^{-2} \text{ m}}$ apart