

33. (a) Eq. 17-25 gives the speed of the wave:

$$v = \sqrt{\frac{\tau}{\mu}} = \sqrt{\frac{150 \text{ N}}{7.2 \times 10^{-3} \text{ kg/m}}} = 1.4 \times 10^2 \text{ m/s} .$$

(b) From the Figure, we find the wavelength of the standing wave to be $\lambda = (2/3)(90 \text{ cm}) = 60 \text{ cm}$.

(c) The frequency is

$$f = \frac{v}{\lambda} = \frac{1.4 \times 10^2 \text{ m/s}}{0.60 \text{ m}} = 2.4 \times 10^2 \text{ Hz} .$$