

24. Using Eq. 17-32 for the average power and Eq. 17-25 for the speed of the wave, we solve for $f = \omega/2\pi$:

$$\begin{aligned} f &= \frac{1}{2\pi y_m} \sqrt{\frac{2P_{\text{avg}}}{\mu \sqrt{\tau/\mu}}} \\ &= \frac{1}{2\pi(7.7 \times 10^{-3} \text{ m})} \sqrt{\frac{2(85 \text{ W})}{\sqrt{(36 \text{ N})(0.260 \text{ kg}/2.7 \text{ m})}}} = 198 \text{ Hz} . \end{aligned}$$