

95. Let the original tension be τ_1 and the new tension be τ_2 . Then

$$\frac{\lambda_{s2}}{\lambda_{s1}} = \frac{v_s/f_2}{v_s/f_1} = \frac{f_1}{f_2} = \frac{v_2/\lambda_1}{v_2/\lambda_2} = \frac{v_1}{v_2} = \sqrt{\frac{\tau_1}{\tau_2}} = \frac{1}{2} .$$

Thus, $\tau_2/\tau_1 = 4$. That is, the tension must be increased by a factor of 4.