

The speed of a transverse wave on a string is 170 m/s when the tension is 120 N . What new tension is required to have a speed of 180 m/s on the string?

$$v = \sqrt{\frac{T}{\mu}}$$

$$v^2 = \frac{T}{\mu}$$

$$T = v^2 \mu = v^2 \left(\frac{T_0}{v_0^2} \right)$$

$$= (180 \text{ m/s})^2 \left(\frac{120 \text{ N}}{(170 \text{ m/s})^2} \right)$$

$$= 134.5 \text{ N}$$

~~140 N~~ 130 N