

Answer on Question #72317-Physics-Other

A string of mass 0.8kg is stretched between 9cm apart. It is observed that when one pole is struck the transverse pulse reaches the other pole in 0.3sec. What is the tension in the pole?

Solution

The speed of wave is

$$v = \frac{l}{t}.$$

But

$$v = \sqrt{\frac{T}{\frac{m}{l}}}$$

Thus,

$$\frac{T}{\frac{m}{l}} = \left(\frac{l}{t}\right)^2$$

The tension in the pole is

$$T = \frac{ml}{t^2} = \frac{(0.8)(0.09)}{0.3^2} = 0.8 \text{ N}.$$

Answer: 0.8 N.