Answer on Question #66793-Physics-Molecular Physics-Thermodynamics

The linear density of a vibrating string 1.3×1/10000 kg/m .A transverse wave is propagation on the string &is describe by the equation y (x,t)= 0.021sin (30t-x) where x&y is in meter &t is in second calculate the tension in the string.

Solution

$$v = \frac{\omega}{k} = \frac{30}{1} = 30\frac{m}{s}$$

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

The tension in the string is

$$T = \mu v^2 = 1.3 \cdot 10^{-4}(30)^2 = 0.117\ N.$$

Answer: 0.117 N.