18. (a) The general expression for $y(x,t)$ for the wave is $y(x,t) = y_m \sin(kx - \omega t)$, which, at $x = 10\,\text{cm}$, becomes $y(x = 10\,\text{cm}, t) = y_m \sin[k(10\,\text{cm} - \omega t)]$. Comparing this with the expression given, we find $\omega = 4.0\,\text{rad/s}$, or $f = \omega/2\pi = 0.64\,\text{Hz}$.

(b) Since $k(10\,\text{cm}) = 1.0$, the wave number is $k = 0.10/\text{cm}$. Consequently, the wavelength is $\lambda = 2\pi/k = 63\,\text{cm}$.

(c) Substituting the values of k and ω into the general expression for $y(x,t)$, with centimeters and seconds understood, we obtain

$$y(x,t) = 5.0 \sin(0.10x - 4.0t) \ .$$

(d) Since $v = \omega/k = \sqrt{\tau/\mu}$, the tension is

$$\tau = \frac{\omega^2 \mu}{k^2} = \frac{(4.0\,\text{g/cm})\left(4.0\,\text{s}^{-1}\right)^2}{\left(0.10\,\text{cm}^{-1}\right)^2} = 6400\,\text{g}\cdot\text{cm/s}^2 = 0.064\ \text{N} \ .$$