1. \( y(x, t) = (2.30 \text{ mm}) \sin (1822x - 588t) \)
   - \( y(x, t) \) can be rewritten as \( y_m \sin (kx - \omega t) \)
   - (a) \( y_m = 2.30 \text{ mm} \)
   - (b) \( \omega = 588 \text{ rad/s} \)
   - (c) \( f = \frac{\omega}{2\pi} = \frac{588 \text{ rad/s}}{2\pi} = 93.6 \text{ Hz} \)
   - (d) \( \lambda = \frac{2\pi}{k} = \frac{2\pi}{1822 \text{ rad/m}} = 3.46 \times 10^{-3} \text{ m} \)
   - (e) \( |U_y|_{\text{max}} = \omega y_m = 1.35 \text{ m/s} \)

2. \( \mu = \frac{F}{U^2} = \frac{123N}{(72 \text{ m/s})^2} = 4.16 \times 10^{-3} \text{ kN/m} \)
   - \( F = \mu U^2 = (4.16 \times 10^{-3} \text{ kN/m})(180 \text{ m/s})^2 = 135N \)

3. \( \mu = m/L = 0.067 \text{ kg} / 9.88 \text{ m} = 1.083 \times 10^{-2} \text{ kg/m} \)
   - \( v = \sqrt{\frac{F}{\mu}} = \left( \frac{2360}{1.083 \times 10^{-2} \text{ kg/m}} \right)^{1/2} = 147.6 \text{ m/s} \)
   - \( f_1 = \frac{v}{2L} = \frac{147.6 \text{ m/s}}{2 (9.88 \text{ m})} = 7.47 \text{ Hz} \)
   - \( f_2 = 2f_1 = 14.9 \text{ Hz} \)
   - \( f_3 = 3f_1 = 22.4 \text{ Hz} \)