

64. (a) Let the displacements of the wave at (y, t) be $z(y, t)$. Then $z(y, t) = z_m \sin(ky - \omega t)$, where $z_m = 3.0 \text{ mm}$, $k = 60 \text{ cm}^{-1}$, and $\omega = 2\pi/T = 2\pi/0.20 \text{ s} = 10\pi \text{ s}^{-1}$. Thus

$$z(y, t) = (3.0 \text{ mm}) \sin [(60 \text{ cm}^{-1}) y - (10\pi \text{ s}^{-1}) t] .$$

- (b) The maximum transverse speed is

$$u_m = \omega z_m = (2\pi/0.20 \text{ s})(3.0 \text{ mm}) = 94 \text{ mm/s} .$$