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A transverse wave is described by

$$y(x,t) = 6.0\,\text{cm}\,\sin(0.020\pi x + 4.0\pi t)$$

Determine

a) y_m

b) λ

c) f

d) v_{wave}

e) propagation direction of wave

f) $v_{Transverse\ max}$

g) $y(3.5\,\text{cm}, 0.26\,\text{s})$

a) $\boxed{y_m = 6.0\,\text{cm}}$ $\quad y(x,t) = y_m \sin(kx + \omega t)$

b) $k = \frac{2\pi}{\lambda}$ $\quad \lambda = \frac{2\pi}{k} = \frac{2\pi}{0.020\pi} = \boxed{100.\,\text{cm}}$

c) $f = \frac{1}{T}$ $\omega = \frac{2\pi}{T}$ $\omega = 2\pi f$

$$f = \frac{\omega}{2\pi} = \frac{4.0\pi}{2\pi} = \boxed{2.0\,Hz}$$

d) $v_{wave} = \lambda f = (100.\,cm)\ 2.0\,Hz = \boxed{200.\,cm/s}$

e) $-x$ direction

since $kx + \omega t$

f) $v(x,t)_{max} = \omega y_m = \left(4.0\pi \frac{rad}{s}\right) 6.0\,cm = 75.4 \frac{cm}{s}$

$\boxed{75\ cm/s}$

g)

$$y(3.5cm, 0.26s) = 6.0cm\ \sin\left[0.020\pi(3.5) + 4.0\pi(0.26)\right]$$

$$= -2.03\,cm$$

$$\boxed{= -2.0cm}$$