Answer on Question #66792, Physics / Mechanics | Relativity |

A sinusoidal wave is describing by $y(x, t) = 3.0 \sin(3.52t - 2.01x)$ cm where x is the position along wave propagation. Determine the amplitude, wave number, wavelength, frequency & velocity of the waves.

Solution

Lets write a equation of a plane wave and compare it with our equation $y(x, t) = 3.0 \sin(3.52t - 2.01x)$.

$y(x, t) = A \sin(\omega t - kx)$,

where A is a magnitude, k is a wave's wave number, ω is a wave's angular frequency.

Therefore the amplitude A = 3.0 cm, the wave number k = 2.01, the frequency $\nu = \omega/2\pi = 0.56$. The wavelength $\lambda = 2\pi/k = 3.12$ and the velocity $V = \lambda \nu = 1.75$.

Answer: A = 3.0, k = 2.01, λ = 3.12, ν = 0.56, V = 1.75.