Answer on Question #66258 - Physics / Mechanics | Relativity

Question

The oscillations of two points x1 and x2 at x=0 and x=1m respectively are modelled as follows:y1=(0.3sin4 pie t) and y2=0.3sin(4 pie t+pie/8).calculate the wavelength and speed of the associated wave.

Solution

$$y1 = 0.3\sin(4\pi t)\,; y2 = 0.3\sin\left(4\pi t + \frac{\pi}{8}\right)$$
$$\Delta\varphi = \frac{\pi}{8};\ \Delta x = 1m;$$
$$\lambda = \frac{2\pi * \Delta x}{\Delta\varphi} = 2 * \frac{1}{\frac{1}{8}} = 16m - wavelength$$
$$\omega = 4\pi = 2\pi\nu;\ \ \nu = 2Hz;\ -frequency$$
$$v = \nu\lambda = 2 * 16 = 32\frac{m}{s}$$

Answer**: wavelength: 16m, speed: 32 m/s**