

Assignment 1b
Due Tuesday, September 3, 2013

1. Consider a pressure wave $p = p_0 \cos [2\pi/\lambda(x-vt)]$ traveling with $v = 345$ m/s. If the wavelength is 2m, calculate the numerical values for f , T , k , and ω .
2. Starting from the definitions $k = 2\pi/\lambda$, $\omega = 2\pi f$, use the relationship $v = \lambda f$ to find an expression for v in terms of k and ω .
3. Add the following two sinusoidal waveforms together by filling in the table below: $\sin(\omega t) + \sin(\omega t + \pi/4)$.

TABLE

ωt	$\sin(\omega t)$	$\sin(\omega t + \pi/4)$	$\sin(\omega t) + \sin(\omega t + \pi/4)$
0			
$\pi/6$			
$\pi/4$			
$\pi/3$			
$\pi/2$			
$\pi/2 + \pi/6$			
$\pi/2 + \pi/4$			
$\pi/2 + \pi/3$			
π			
$\pi + \pi/6$			
$\pi + \pi/4$			
$\pi + \pi/3$			
$3\pi/2$			
$3\pi/2 + \pi/6$			
$3\pi/2 + \pi/4$			
$3\pi/2 + \pi/3$			
2π			

Plot the results for the three waveforms on a piece of graph paper. Is the sum of the two waveforms a sinusoidal wave of angular frequency ω ? Explain your answer.