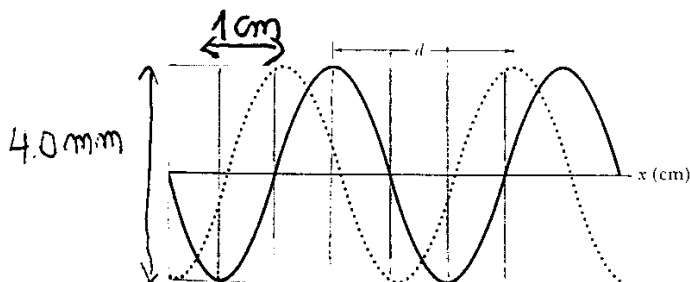


Problem 1 [10 points]

A sinusoidal wave moving along a string in the positive direction of the x-axis is pictured in figure 1 below. The two curves in this figure represent the wave in two freeze-frames, first as a solid curve and then 1.0 ms later, as a dotted curve. Each string element oscillates vertically (perpendicular to the x-axis) a total distance of 4.0 mm, as the wave passed through it. The wave moved a distance $d = 3.16$ cm to the right in the 1.0 ms time interval. Write an equation for this wave in the form

$$y(x, t) = y_m \sin(kx \pm \omega t), \quad (1)$$

where \pm indicates, that the proper sign must be determined.



Problem 2 [10 points]

Two sinusoidal waves with the same amplitude of 4.0 mm and the same wavelength traveled together along a string, that is stretched along the x-axis. The resultant wave due to their interference is represented in figure 2. The curves in this figure represent the resultant wave in two freeze frames, first as a solid curve and then 1.0 ms later, as a dotted curve. The wave moved a distance of $d = 4.20$ cm to the right in the 1.0 ms time interval. Write equations for the two interfering waves and their resultant wave.