

The function  $\psi(x, t)$  describes the displacement of a stretched string from its equilibrium position. Consider **only** the portion of the string between  $x = 0$  and  $L$ , and find the function that describes its displacement at ALL times.

(Hint – this is not a single-wavelength/single frequency problem.)

1. Initial conditions:  $\psi(x, t = 0) = A \sin\left(\frac{\pi x}{L}\right) \left(1 + \cos\left(\frac{\pi x}{L}\right)\right)$   $\frac{\partial \psi(x, t = 0)}{\partial t} = 0$
2. Boundary conditions:  $\psi(x = 0, t) = 0$   $\psi(x = L, t) = 0$