$$y(x,t) \quad = \quad A \sin\left(\frac{\pi n x}{L}\right) \cos(\omega_n t)$$

$$y_1(x,t) \quad = \quad \frac{A}{2} \sin\left(\frac{\pi n x}{L} \; - \; \omega_n t\right)$$

$$y_2(x,t) \quad = \quad \frac{A}{2} \sin\left(\frac{\pi n x}{L} \; + \; \omega_n t\right)$$

$$y_i(x,t) \quad = \quad A \sin\left(kx \; - \; \omega t\right)$$

$$y_1(x,t) \quad = \quad B \sin\left(kx \; - \; \omega t\right)$$

$$y_2(x,t) \quad = \quad C \sin\left(kx \; + \; \omega t\right)$$

$$y_3(x,t) \quad = \quad D \cos\left(kx \; - \; \omega t\right)$$

$$y_4(x,t) \quad = \quad E \cos\left(kx \; + \; \omega t\right)$$

$$y_i(0,t) \; + \; y_2(0,t) \; + \; y_4(0,t) \quad = \quad 0$$

$$A \sin\left(0 \; - \; \omega t\right) \; + \; C \sin\left(0 \; + \; \omega t\right) \; + \; E \cos\left(0 \; + \; \omega t\right) \quad = \quad 0$$

$$\frac{dy_i(0,t)}{dt} \; + \; \frac{dy_2(0,t)}{dt} \; + \; \frac{dy_4(0,t)}{dt} \quad = \quad 0$$

$$y_r(x,t) \quad = \quad -A \sin\left(kx \; + \; \omega t\right)$$

$$y_r(x,t) \quad = \quad A \sin\left(kx \; + \; \omega t\right)$$

$$y(x,t) \quad = \quad 0$$