

4-6 #3

4.4 way

$$y'' + y = \sin(x) \quad y_c = C_1 \sin(x) + C_2 \cos(x)$$

$$y_p = x(A \sin(x) + B \cos(x))$$

$$y_p' = (A \sin(x) + B \cos(x)) + x(A \cos(x) - B \sin(x))$$

$$y_p'' = (A \cos(x) - B \sin(x)) + (A \cos(x) - B \sin(x)) + x(-A \sin(x) - B \cos(x))$$

$$y_p'' + y_p = \sin(x)$$

$$\Rightarrow 2(A \cos(x) - B \sin(x)) = \sin(x)$$

$$\boxed{A=0}$$

$$-2B = 1$$

$$\boxed{B = -1/2}$$

$$\boxed{y = y_c + y_p}$$