4.4

8

$$4y'' - 4y' - 3y = \cos(2x)$$

$$4m^2 - 4m - 3 = 0$$

$$m = \frac{3}{2} \qquad m = -\frac{1}{2}$$

$$y_c = c_1 e^{\frac{3}{2}x} + c_2 e^{-\frac{1}{2}x}$$

$$y_p = A\cos(2x) + B\sin(2x)$$
$$y_p' = -2A\sin(2x) + 2B\cos(2x)$$
$$y_p'' = -4A\cos(2x) - 4B\sin(2x)$$

$4y''$

$-4y'$

$-3y$

$\cos(2x)$

$$-16A\cos(2x) \qquad -16B\sin(2x)$$
$$-8B\cos(2x) \qquad +8A\sin(2x)$$
$$-3A\cos(2x) \qquad -3B\sin(2x)$$

$$-(19A + 8B)\cos(2x) + (8A - 19B)\sin(2x)$$

$$8A - 19B = 0 \qquad \begin{bmatrix} 8 & -19 & | & 0 \\ 19 & 8 & | & -1 \end{bmatrix}$$
$$19A + 8B = -1$$

$$\boxed{A = -19/425}$$
$$\boxed{B = -8/425}$$

$$\begin{bmatrix} 1 & 0 & | & -19/425 \\ 0 & 1 & | & -8/425 \end{bmatrix}$$

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