

12.11

1 12.11, §1 Asked

Solve:

$$y'' + y = x \quad y(1) = 0, y'(1) = 1$$

2 12.11, §2 Solution

$$y'' + y = x \quad y(1) = 0, y'(1) = 1$$

Homogeneous solution:

$$y_h = A \cos x + B \sin x$$

Guess the particular solution $Cx + D$:

$$y_p = x$$

General solution:

$$y = x + A \cos x + B \sin x$$

Put in the initial conditions

$$y(1) = 1 + A \cos 1 + B \sin 1 = 0 \quad y'(1) = 1 - A \sin 1 + B \cos 1 = 1$$

to find $A = -\cos 1$ and $B = -\sin 1$:

$$y = x - \cos 1 \cos x - \sin 1 \sin x = x - \cos(x - 1)$$

