

Consider :

$$\frac{d^2 y}{dx^2} + y = 3x \quad - (1)$$

(6. Step Lesson "Mathematical Methods for Science Students").

The particular integral is :

$$y = 3x \quad - (2)$$

The complementary function is :

$$y = Ae^{ix} + Be^{-ix} \quad - (3)$$

found from the reduced equation:

$$\frac{d^2 y}{dx^2} + y = 0 \quad - (4)$$

The complete solution is :

$$y = Ae^{ix} + Be^{-ix} + 3x$$

Note that (3) is not a solution of (1).

---