

## Excercise:

**Solve the following higher order Cauchy Euler differential equations:**

1.  $\frac{d^2 y}{dx^2} - 2\frac{dy}{dx} - 3y = 2x + 1$
2.  $9\frac{d^2 y}{dx^2} + 12\frac{dy}{dx} + 4y = e^{-2/3x}$
3.  $\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} + 2y = 2e^{-x}$
4.  $\frac{d^2 y}{dx^2} + 4\frac{dy}{dx} + 3y = e^{-3x}$
5.  $\frac{d^3 y}{dx^3} - 6\frac{d^2 y}{dx^2} + 11\frac{dy}{dx} - 6y = e^{2x}$
6.  $\frac{d^2 y}{dx^2} + 9y = x^2 + x + 1$
7.  $\frac{d^2 y}{dx^2} - \frac{dy}{dx} - 2y = e^x$

**Solve the following higher order Cauchy Euler differential equations:**

8.  $x^2 \frac{d^2 y}{dx^2} - 2x \frac{dy}{dx} - 4y = 0$
9.  $4x^2 \frac{d^2 y}{dx^2} + 8x \frac{dy}{dx} + y = 0$
10.  $x^2 \frac{d^2 y}{dx^2} + 3x \frac{dy}{dx} + 3y = 0$
11.  $x^3 \frac{d^3 y}{dx^3} + 5x^2 \frac{d^2 y}{dx^2} + 7x \frac{dy}{dx} + 8y = 0$
12.  $x^3 \frac{d^3 y}{dx^3} - 4x^2 \frac{d^2 y}{dx^2} + 8x \frac{dy}{dx} - 8y = 0$
13.  $x^2 \frac{d^2 y}{dx^2} - 2x \frac{dy}{dx} + 2y = 0$