

1: Solve the following IVPs.

- (a) $y'' + 3y' + 2y = 0$ with $y(0) = 1, y'(0) = 0$
- (b) $y'' + 4y' + 5y = 0$ with $y(0) = 3, y'(0) = 1$
- (c) $4y'' - 4y' + y = 0$ with $y(1) = 1, y'(1) = 2$

2: Solve the following DEs.

- (a) $y'' - 2y' + 5y = 10x^2 - 3x$
- (b) $y'' + 2y' - 2y = 3xe^{2x}$

3: Solve the following DEs.

- (a) $2y'' + y' - y + x + e^{-x} = 0$
- (b) $y'' - 6y' + 10y = e^{3x} \sin x$

4: Solve the following IVPs.

- (a) $4y'' - y = x$ with $y(0) = 2, y'(0) = 1$
- (b) $y'' - 6y' + 9y = e^{3x}$ with $y(0) = 1, y'(0) = 0$

5: Solve the following third-order DEs.

- (a) $y''' + 2y'' - 5y' - 6y = 0$
- (b) $y''' - 3y' + 2y = 2 \sin x$