

### Practise Problems

Find the general solution to the equation in each case.

1.  $y''(t) - y'(t) - 2y(t) = 0$        $y(t) = C_1 e^{2t} + C_2 e^{-t}$

2.  $y''(t) + 5y'(t) + 6y(t) = 0$        $y(t) = C_1 e^{-2t} + C_2 e^{-3t}$

3.  $2y''(t) - y'(t) - y(t) = 0$        $y(t) = C_1 e^{-t/2} + C_2 e^t$

4.  $3y''(t) - 2y'(t) - y(t) = 0$        $y(t) = C_1 e^{-t/3} + C_2 e^t$

5.  $y''(t) + 4y(t) = 0$        $y(t) = C_1 \cos(2t) + C_2 \sin(2t)$

6.  $y''(t) + 4y'(t) + 5y(t) = 0$        $y(t) = e^{-2t}[C_1 \cos(t) + C_2 \sin(t)]$

7.  $y''(t) - 2y'(t) + 4y(t) = 0$        $y(t) = e^t[C_1 \cos(t\sqrt{3}) + C_2 \sin(t\sqrt{3})]$

8.  $y''(t) - 4y'(t) + 4y(t) = 0$        $y(t) = e^{2t}[C_1 + C_2 t]$

9.  $4y''(t) + 4y'(t) + y(t) = 0$        $y(t) = e^{-t/2}[C_1 + C_2 t]$

10. In each case, find the unique particular solution that satisfies:

$$y(0) = 1 \quad y'(0) = 0$$