

## TWK2A Systems of Linear DEs (Section 4.8) Problems

Solve the following systems of linear DEs:

1.

$$\begin{aligned}\frac{dx}{dt} &= -y + t \\ \frac{dy}{dt} &= x - t\end{aligned}$$

2.

$$\begin{aligned}(D^2 + 5)x - 2y &= 0 \\ -2x + (D^2 + 2)y &= 0\end{aligned}$$

3.

$$\begin{aligned}D^2x + Dy &= -5x \\ Dx + Dy &= -x + 4y\end{aligned}$$

4.

$$\begin{aligned}Dx + z &= e^t \\ (D - 1)x + Dy + Dz &= 0 \\ x + 2y + Dz &= e^t\end{aligned}$$

5.

$$\begin{aligned}\frac{dx}{dt} &= y - 1 \\ \frac{dy}{dt} &= -3x + 2y \\ x(0) &= 0, y(0) = 0\end{aligned}$$

6.

$$\begin{aligned}Dx + 4y &= 1 \\ Dy + x &= 2\end{aligned}$$