1. Convert $3u'' - 2u' + 5u = 4$ into a system of first order linear differential equations with constant coefficients.

2. A 2×2 system with real values.

   (a) Find the general solution to

   $$\begin{array}{rcrcr} x_1' & = & -7x_1 & + & 10x_2 \\ x_2' & = & -5x_1 & + & 8x_2 \end{array}.$$

   (b) Draw a phase portrait for the system above.

   (c) Find the solution with initial conditions $x_1(0) = 1$, $x_2(0) = -1$.

3. [7.5.14] Find the general solution to $\mathbf{x}' = \begin{bmatrix} 1 & -1 & 4 \\ 3 & 2 & -1 \\ 2 & 1 & -1 \end{bmatrix} \mathbf{x}$.

4. [7.5.10] Complex entries. Find the general solution to $\mathbf{x}' = \begin{bmatrix} 2 & 2+i \\ -1 & -1-i \end{bmatrix} \mathbf{x}$.