1. Find all eigenvector/eigenvalue pairs for the following matrices.

   (a) $\begin{bmatrix} 7 & 8 \\ -4 & -5 \end{bmatrix}$

   (b) $\begin{bmatrix} 4 & -3 \\ 6 & -2 \end{bmatrix}$

   (c) $\begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & 0 \\ -4 & 4 & 3 \end{bmatrix}$

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 $x_1(0) = 1$, $x_2(0) = -1$.