1. Give an example of a 2×2 (two equations in two unknowns) system of linear equations such that
   (a) The system has a unique solution.
   (b) The system has no solution.
   (c) The system has infinitely many solutions.

2. Solve the following system of linear equations.

$$\begin{aligned} 3x_1 - x_2 + 2x_3 + 4x_4 + x_5 &= 2 \\ x_1 - x_2 + 2x_3 + 3x_4 + x_5 &= -1 \\ 2x_1 - 3x_2 + 6x_3 + 9x_4 + 4x_5 &= -5 \\ 7x_1 - 2x_2 + 4x_3 + 8x_4 + x_5 &= 6 \end{aligned}$$

3. (a) Solve problem 3.18 in Section One.I.3. You should get two general solutions that look different.
   (b) The vector $\begin{pmatrix} 0 \\ 0 \\ 0 \\ 4 \end{pmatrix}$ is a solution of this system. In the **first** of your general solutions, what value of the parameter gives you this solution?
   (c) The vector $\begin{pmatrix} 0 \\ 0 \\ 0 \\ 4 \end{pmatrix}$ is a solution of this system. In the **second** of your general solutions, what value of the parameter gives you this solution?
   (d) The vector $\begin{pmatrix} -5 \\ 1 \\ -7 \\ 10 \end{pmatrix}$ is a solution of this system. In the **first** of your general solutions, what value of the parameter gives you this solution?
   (e) The vector $\begin{pmatrix} -5 \\ 1 \\ -7 \\ 10 \end{pmatrix}$ is a solution of this system. In the **second** of your general solutions, what value of the parameter gives you this solution?
   (f) Plug in the value 2 for the parameter into each of your two general solutions. Do you get the same particular solution? Is that okay?