Week 9 - Linear Algebra

1. **TICKABLE** Use Sage to solve the following system of equations:

$$\begin{cases} 10x + 2y = 0 \\ 2x - y = 154 \end{cases}$$

2. **TICKABLE** Note that the above system of equations is equivalent to the following systems of equations:

$$\begin{cases} 10a + 2b = 0 \\ 2a - b = 154 \end{cases}$$

$$\begin{cases} 10m + 2n = 0 \\ 2m - n = 154 \end{cases}$$

   In essense the only thing that defines the system of equations is the cofficients:

$$\begin{pmatrix} 10, 2, 0 \\ 2, -1, 154 \end{pmatrix}$$

   We can of course seperate the right hand side of our equation and perhaps include those elements in a vector:

$$\begin{pmatrix} 0 \\ 154 \end{pmatrix}$$

3. Matrix multiplication.
4. Matrix inversion
5. Enter the following matrices in to a list. Invert all of them.
6. Plotting something?
7. Solve a large number of systems of linear equations
8. Reading in data for a big system of linear equations
9. Creating a big linear system.