1 | Looking forward

- Will use canvas's discussion board in the future.
- Assume matrices have real numbers

2 | Solving with Matrices

- Elementary matrices (like $\begin{bmatrix} 1 & -2 \\ 0 & 1 \end{bmatrix}$)
- Steps walk through
  - Start with $\begin{bmatrix} a & b \\ d & e \end{bmatrix}$ (the coefficient matrix).
  - You want to get somewhere such that $\begin{bmatrix} 1x \\ 0y \end{bmatrix} = \begin{bmatrix} c \\ f \end{bmatrix}$
  - And ultimately $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} ans_x \\ ans_y \end{bmatrix}$
  - srcD3SolveWithMatricies.png

3 | Matrix Inverse Formula

- I should technically know this already.

3.1 | Derivation

\[$[a\&b\backslash$\&d$]$ $[w\&x\backslash$\&z$]$ $[aw + by\&ax + bz\backslash$ cw+dy&cx+dz$]\backslash$
(∴.
\]

- There's two 2 variable equations. srcIdentityMatrixFormula.png

4 | Matrix Operations

- If we have a set of objects that are almost groups in under both addition and multiplication, then it's called a field
  - 2x2 Matrices aren't quite close enough on the multiplication (too many no inverses) but we can work with other sizes. ### Vector Products
- Matrices of dimension nx1
- What multiplications on vectors are "nice"?
  - Transpose the first (left) one and multiply normally, then squish 2x2 into 2x1
  - Cross product

- Element wise (is closed)
- Take every element and multiply them all together, and then duplicate?
    * No, no identity
- Any one to one mapping?
    * No, identity doesn't work if it's on the left.
