I think most of you will be busy with 6.2, still. We're looking to finish up with Chapter 6, including the Written Work for Chapter 6, early next week.

I'm working up the 6.3 notes and videos, right now.

By mid-week, next week, we should be into Section 7.1 and Laplace Transforms.

Connor asked me about this in class, today. I gave him a layman's explanation, which boils down to:

We can reduce systems of linear ODEs with constant coefficients to a linear algebra question.

Reducing one sort of problem to a system of linear equations (linear algebra) problem is arguably 99% of all mathematics, if you think about it. Even the quadratic formula!

The scribbles on the next page are related to my bloviating on the topic out of memory.

Would that I had been more successful inculcating the linear algebra principles and techniques, but it's beyond the scope of the course, technically.

$$\mathcal{L}(y'' + y) = 0$$
$$= s^2 + 1$$

$$\begin{bmatrix} y_1 & y_2 \\ y_1' & y_2' \end{bmatrix}$$

Layman's discussion of Laplace Transform.

I don't think I was recording, but Connor said he'd heard of them and I gave him a brief description.

I tried to shoe-horn some linear algebra and matrix algebra into the course, but it didn't 'take."

$s^2 + 3s + 2$

$y'' + 2y = 0$

$y'' + 3y' + 2y = 0$

So we'll be somewhat limited inn what we can do with them or to see the power of the Laplace Transform in dealing with systems of linear ODEs with constant coefficients.

$x + 2y = 3$

$3x - 2y = 5$

$$\begin{bmatrix} 1 & 2 \\ 3 & -2 \end{bmatrix} = A$$

$$\bar{x} = \begin{bmatrix} x \\ y \end{bmatrix}$$

$$\bar{b} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

You can at least get the idea in a 2-D setting, hard as it is for me to hold myself down to 2 D, and absolutely *clobber* this stuff with a CAS.

$$A\bar{x} = \bar{b}$$

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 19 & 22 \\ 43 & 50 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 \\ 3 & -2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = A^{-1}\begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

$$A^{-1} = \frac{1}{\text{Determinant}}\begin{bmatrix} & \\ & \end{bmatrix}$$

$\to (s^2+1)(3s+1)($