

Source:

1 | **new schedule today :/**

2 | **Systems of equations, matrix equations, and vectors**

3 | **in class work! See ./KBe20math530srcNull_space_and_column_space_intro.pdf**

3.1 | **parts of the question**

3.1.1 | **How many solutions x satisfy $Ax = 0$?**

3.1.2 | **When the answer is "infinitely many" what tools might we have to describe the size of that set?**

3.1.3 | **How many possible outcomes b are there for the equation $Ax = b$ for any x .**

3.2 | $A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

3.2.1 | **How many solutions x satisfy $Ax = 0$?**

The only solution is $x=0$, because $Ax = x$.

3.2.2 | **When the answer is "infinitely many" what tools might we have to describe the size of that set?**

N/A

3.2.3 | **How many possible outcomes b are there for the equation $Ax = b$ for any x .**

There can be infinitely many values of b ..?

3.3 | $A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$

3.3.1 | **How many solutions x satisfy $Ax = 0$?**

Infinitely many (anything of the form $\begin{pmatrix} 0 \\ 0 \\ x \end{pmatrix}$)

3.3.2 | **When the answer is "infinitely many" what tools might we have to describe the size of that set?**

A column in the matrix is zero? Maybe the columns are linearly dependent

3.3.3 | **How many possible outcomes b are there for the equation $Ax = b$ for any x .**

Infinite with dim2?

$$3.4 \mid A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{pmatrix}$$

3.4.1 | **How many solutions x satisfy $Ax = 0$?**

only one value of x makes the product zero.

3.4.2 | **When the answer is "infinitely many" what tools might we have to describe the size of that set?**

3.4.3 | **How many possible outcomes b are there for the equation $Ax = b$ for any x .**