

Ken Ken



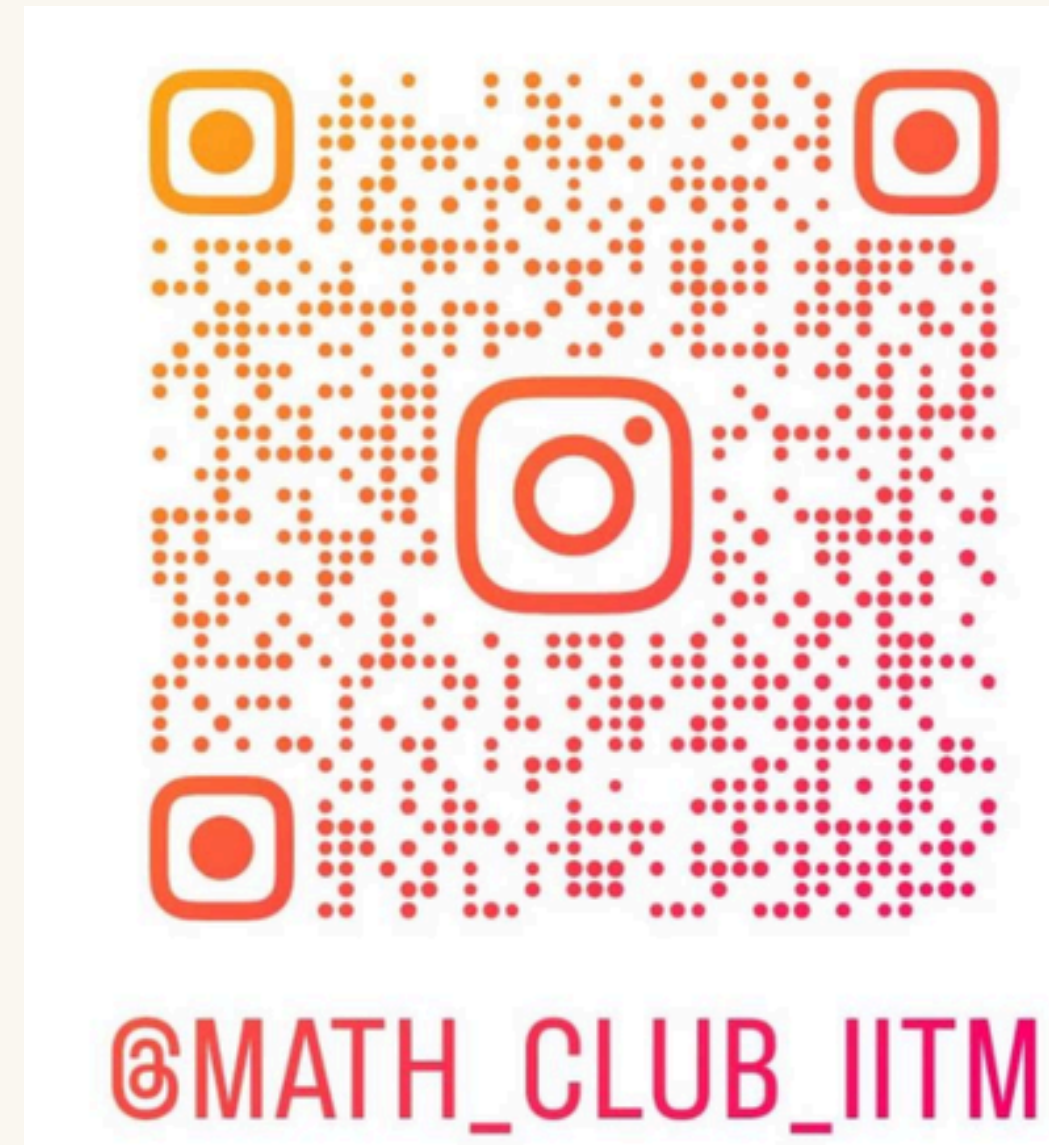
l.mathiitm.com/kenkenduel

Nim Game



<https://harraboy13.github.io/nim-game/>

Some things to join



Some Math Yap

Let's chat about this fellow

MATH CLUB IIT-M

Kailash Anand

Hello fellow math people!

A question to think about:

$$5x^2 + 4xy + 2y^2$$

1. Can you complete the square?
2. Is the way you completed the square unique?
3. (bonus) Do you see a matrix anywhere?

Why do I care about these things?



Hopefully NOT you lol

Why do I care about these things?

Basically, they are nice ways to analyze
things we care about in life

LINEARITY!!!!!!!

$$\frac{d}{dt} \vec{x} = f(\vec{x})$$

Let's think about a matrix...

What are the words that come to your mind when you see this guy:

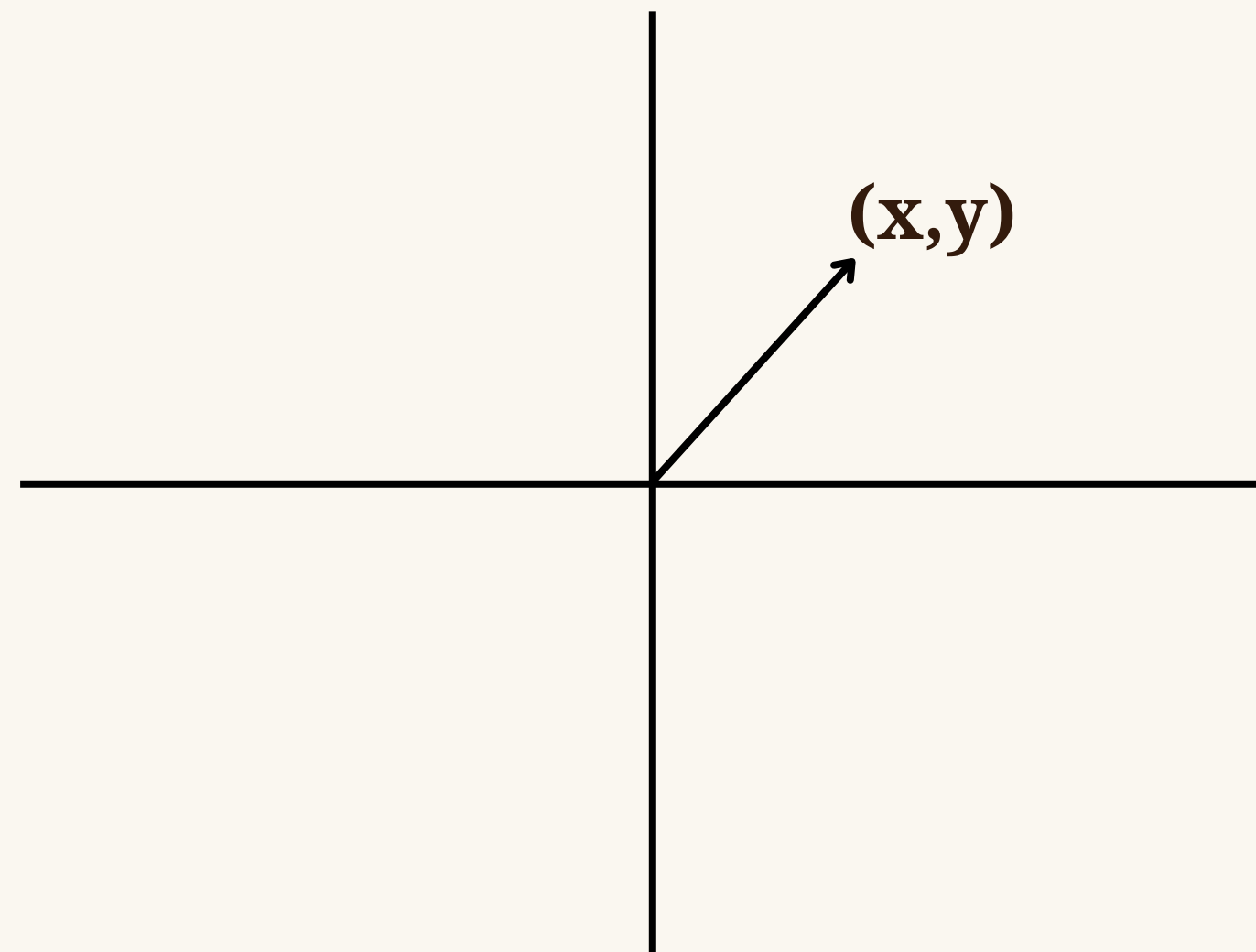
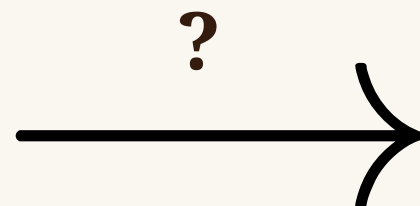
$$A = \begin{pmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$$

- Kind of looks symmetric?
- ...?

“Basis”: A perspective

Our life was a lie...

$$\begin{pmatrix} x \\ y \end{pmatrix}$$



A peculiar property

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = c \begin{pmatrix} x \\ y \end{pmatrix}$$

Back to velocity fields

What kind of A makes this easy to solve?

$$\frac{d}{dt} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{pmatrix} = A \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{pmatrix}$$

“Diagonalization”

$$D = B^{-1}AB \implies A = BDB^{-1}$$

Thank you!