#flo #inclass

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1 | determinant! for realsies.

determinant of 2x2 matrix

$$\begin{array}{|cc|} \hline a & b \\ c & d \\ \hline \end{array}$$

ad-bc

determinant |a| = a

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|| around something: generally the size. apllies to magnitudes, absolute value, and cardinality. and de
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1.0.1 | new method

[a11 …….. a1n] . | . | . | . | . | [an1……..ann]

choose a row or a column and expand along it. any row, any column choose each element and multiply it by the submatrix??

Multiply each element in any row or column of the matrix by its cofactor. The sum of these products gives the value of the determinant. – google

1 1 -1 2 0 2 1 3 -2

choose middle row: first 2x2 det: -1 [2 2 1 -2]

second: 1 -1 1 -2 * 0

third: 1 -1 2 2 * 3

take the determiant of each submatrix

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use alternating coeficants!!

pos, neg, pos, ect.
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1.0.2 | why?

make a torus! to do this to a plane: glue the top to the bottom to make a tube, then connect the ends of the tubs many games operated on a torus – come out the left, go into the right

think of our matrix as operating on a torus: if you come out, you just come back in and uh, what?

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title: proof by induction
prove something is true for the base case
prove that it's true for n+1.

like a domino proof:
make sure all the dominoes will hit the next one
then hit the first domino
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determinant: definition by induction?

1.0.3 | cross product

inp: 3x1 vectors

[a,b,c] [d,e,f]

$$\begin{bmatrix} i & j & k \\ a & b & c \\ d & e & f \end{bmatrix}$$

then you just take the determinant:

- $i * (bf - ce) - j(af - cd) + k(ae - bd)$

1.0.4 | questions

- do matricies always have an inverse?
  - what about the all zero matrix?
- **what is a geometric intrepretation of the cross product?**
  - use it to find a plane containing two given vectors
  - did this one!
- properties of the determinant
  - why ||?
  - why torus version?
  - |a b| = ?

1.0.5 | ending review

what is cos? adjacent/hypotenuse when looking at a right triangle.. dont have a right triangle? make one!
dot product: gives you the lenght of a projection of a vector onto the other one
selina's proof!