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Chapter 3 Advance Algebra

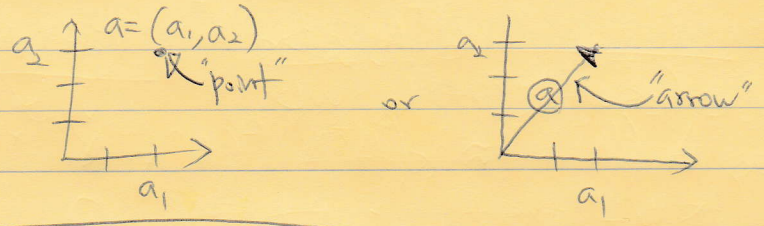
- Linear Algebra is not only important in numerical data.
  It is also important in geometry that handles line, arrow, image, ...etc.

- Vector

↳ Vector a that has N-dimension, we can think that a space that has N-dimension.

↳ It could be "points" or "arrows".

Example) $a = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix}$



- Vector's Length

↳ Vector a's length can be defined as "norm" ($\|a\|$).

$$\|a\| = \sqrt{a^T a} = \sqrt{a_1^2 + \cdots + a_N^2}$$

example) $a = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$, then, the $\|a\|$ is $\sqrt{1^2+2^2} = \underline{\sqrt{5}}$

- Multiply "Scalar" and "vector"

↳ If I multiply "positive scalar" and a "vector", a direction of arrow doesn't change. only length is getting bigger.

↳ If I multiply "negative scalar" and a "vector", a direction will change, and the length will be changed.