~~Chu~~ 백지노트 wk 1 - lec 1

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- Lecture was focused on notations regarding math.

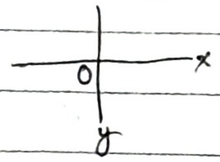
$\mathbb{R}$: real numbers

$\in$: is element of , $\not\subset$: not a subset → all the possible set of pair of real number x, y

(,) : pair : round brackets $\mathbb{R}^2 \in \{(x,y) \mid x, y \in \mathbb{R}\}$

{ , , } : set : curly bracket

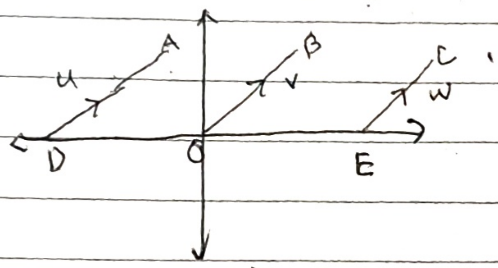
[,] : coordinates of vector { row vector [ ] / column vector [ ] } = (any point on cartesian plane)



Linear algebra: study of vector space. → set of objects that can be added / scaled.

Vector: magnitude + direction (x position)

ex) displacement, velocity



tail: starting point
head: ~~ending~~ terminal point.

$\underset{\sim}{u}$ or $\mathbf{u}$ = $\overrightarrow{DA}$ ← floating vector
$\underset{\sim}{v}$ or $\mathbf{v}$ = $\overrightarrow{OB}$ ← fixed vector (tail on origin) standard position
} equal

unit vector: has size of 1 direction?
$\hat{v}$ ← denoted by hat

zero vector : $\overrightarrow{OO}$: size of zero → no direction.

$p \Rightarrow q$ p implies q, if p then q, p only if q

$p \Leftarrow q$ q only if p

$p \Leftrightarrow q$ equivalent statement, p if ~~only~~ and only if q

Wk 1 - lecture 2

Sum of vectors

$\underset{\sim}{v} = [2, 1]$

$\underset{\sim}{w} = [1, 3]$

$\underset{\sim}{v} + \underset{\sim}{w} = [3, 4]$

← commutativity applies to addition of vectors

Scalar Multiplication

↳ λ (lambda) "arbitary $\mathbb{R}$"

if λ value is negative, opposite direction

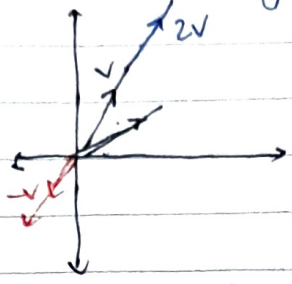
$\underset{\sim}{v} = [1, 2]$

$2\underset{\sim}{v} = [2, 4]$

$3\underset{\sim}{v} = [3, 6]$

$\frac{1}{2}\underset{\sim}{v} = [\frac{1}{2}, 1]$

$-\underset{\sim}{v} = [-1, -2]$



vector subtraction

$\underset{\sim}{u} - \underset{\sim}{v} = \underset{\sim}{u} + (-\underset{\sim}{v})$

$= [u_1 - v_1, u_2 - v_2]$

Vectors in $\mathbb{R}^3$ — set of all ordered tuples of real numbers. size = 3

$\mathbb{R}^3 = \{(x, y, z) \mid x, y, z \in \mathbb{R}\}$ (3D space)

~~text~~ Geogebra — online resource

$\mathbb{R}^n = \{(x_1, x_2 \cdots x_n) \mid x_1, x_2 \ldots x_n \in \mathbb{R}\}$

= set of all n-tuples of real numbers.

ordered

row vector: $\underset{\sim}{v} = [v_1, v_2, v_3, \ldots v_n]$

column vector: $\underset{\sim}{v} = \begin{bmatrix} v_1 \\ v_2 \\ v_3 \\ \vdots \\ v_n \end{bmatrix}$

vector addition — input = 2 vectors, output = 1 vector

scalar m — input = 1 v, 1 λ output = 1 vector