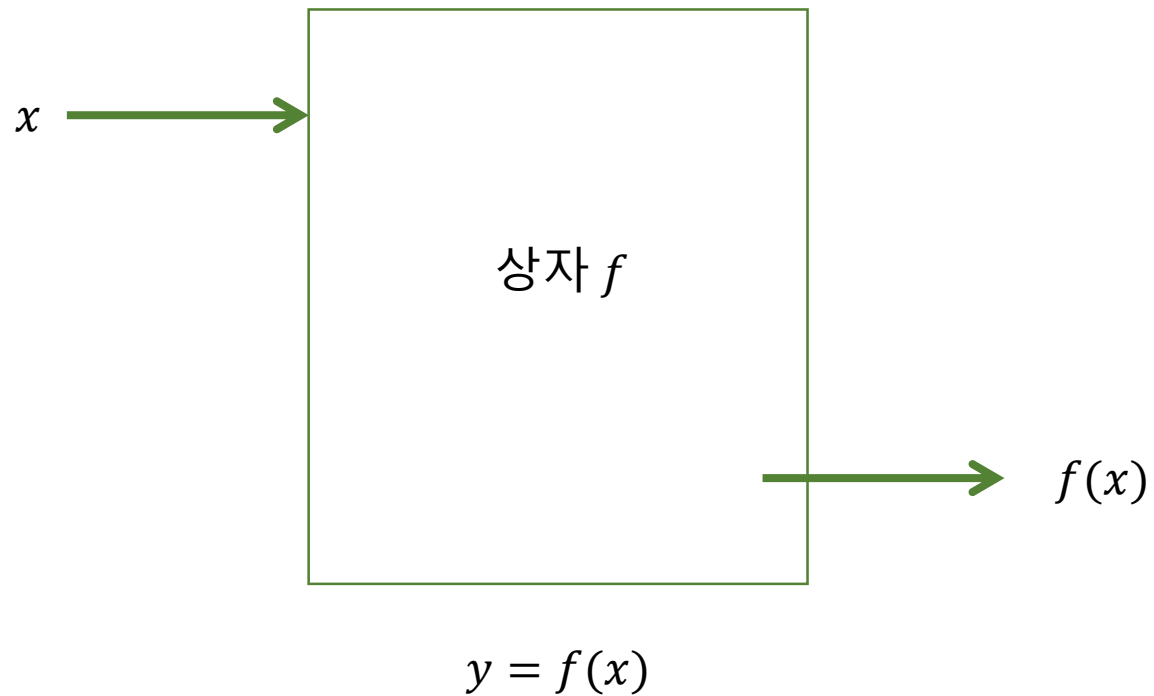
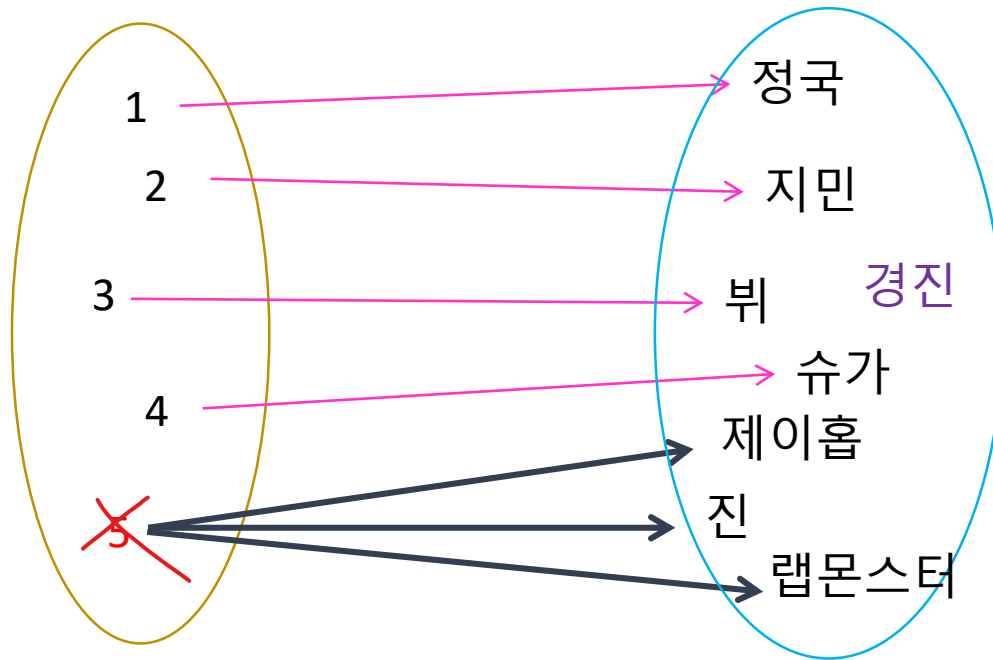


# Functions (函數)





정의역( domain ) 1 2 3 4

공역( codomain )

치역( range )

$$f(x) = x + 1$$

$$f(x) = a^x$$

$$f(x) = x^2 + 2021$$

$$f(x) = \log x$$

$$f(x) = x^n + x^{n-1} + \dots + 1$$

$$f(x) = \sin x$$

$$f(x) = \sqrt{1+x}$$

$$f(x) = \sinh x$$

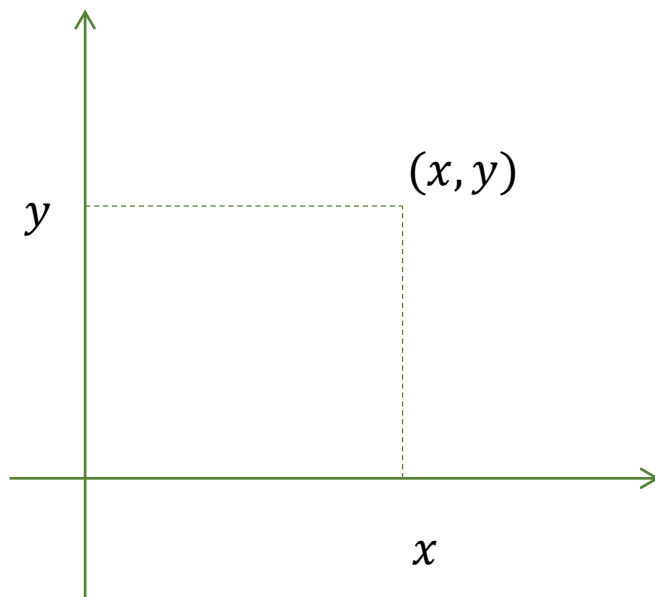
$$f(x) = \frac{2x}{x^2 - 1}$$

$$\frac{0}{0}$$

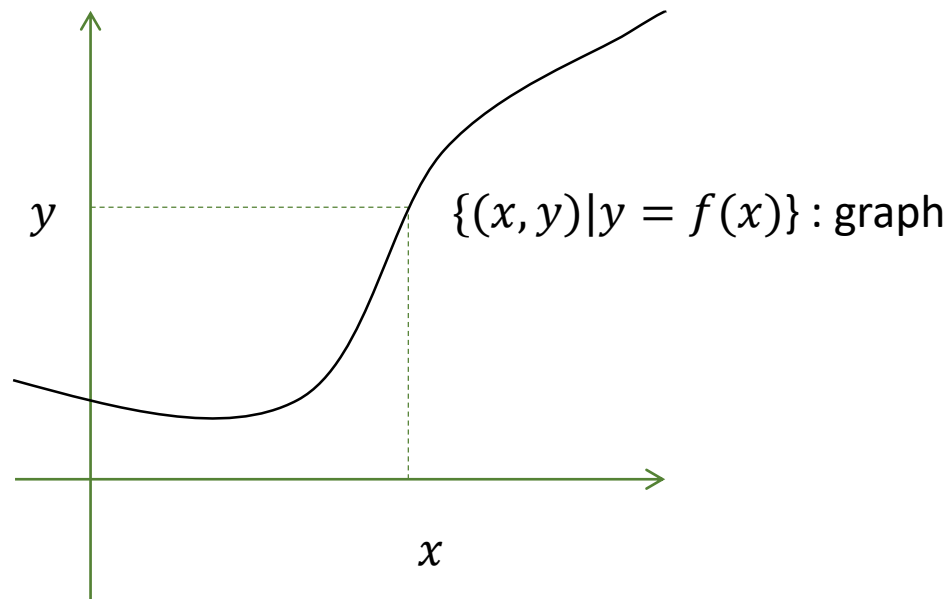
$$\sqrt{-15}$$

# 미지수 $x$

- Descartes (1596~1650)
- $y = f(x)$ ,  $z = f(x, y)$ ,  $w = f(x, y, z) \dots \dots \dots$
- $y = f(x_1, x_2 \dots x_n)$



# 그래프

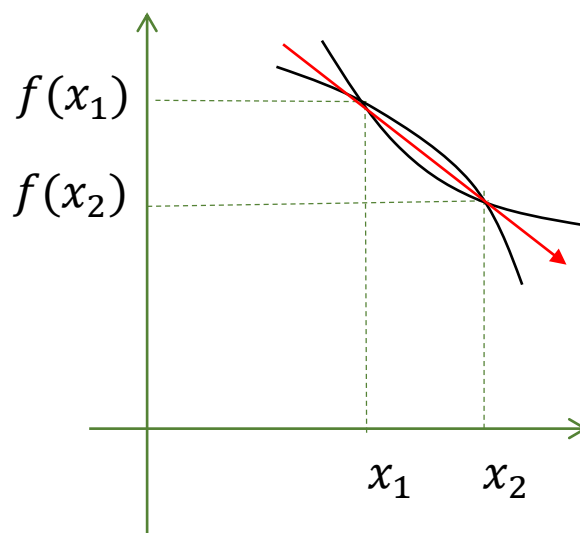
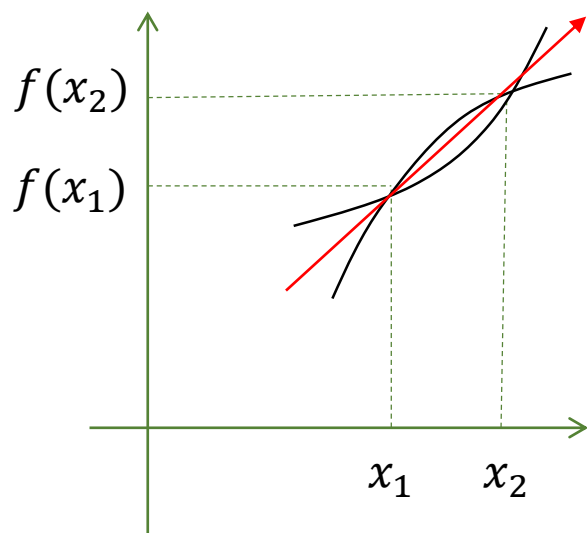


for all

$$\forall x_1, x_2 \in [a, b]$$

$$x_1 < x_2 \Rightarrow f(x_1) < f(x_2) \quad \text{증가함수}$$

$$x_1 < x_2 \Rightarrow f(x_2) < f(x_1) \quad \text{감소함수}$$



# 역함수(Inverse Function)

함수  $f$  가 같은 값을 두 번 이상 갖지 않을 때 일대일 함수라고 한다.

$$x_1 \neq x_2 \quad \text{일 때} \quad f(x_1) \neq f(x_2)$$

$f$  가 일대일 함수라 하자.  $f$ 의 역함수  $f^{-1}$  는

$$f^{-1}(y) = x \quad \Leftrightarrow \quad f(x) = y$$

로 정의된다.

$f^{-1}$  의 정의역 =  $f$  의 치역

$f^{-1}$  의 치역 =  $f$  의 정의역

$$f^{-1}(x) \neq \frac{1}{f(x)}$$