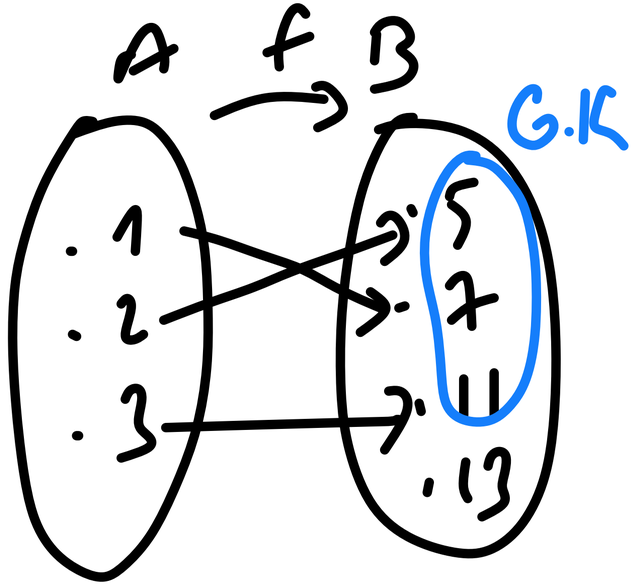
Fonksiyon: Makine

A ve B kümeleri



$f: A \to B$

T.K — Y.K

$\{(1,7),(2,5),(3,11)\}$

$f(1)=7 \quad f(2)=5 \quad f(3)=11$

✗ $f: \mathbb{N} \to \mathbb{R} \quad f(x)=\frac{x}{x-2}$

0, 1, 2

✗ $f: \mathbb{N} \to \mathbb{N} \quad f(x)=\frac{x}{x+2}$

1 → 0, 2

$f(1)=\frac{1}{3}$

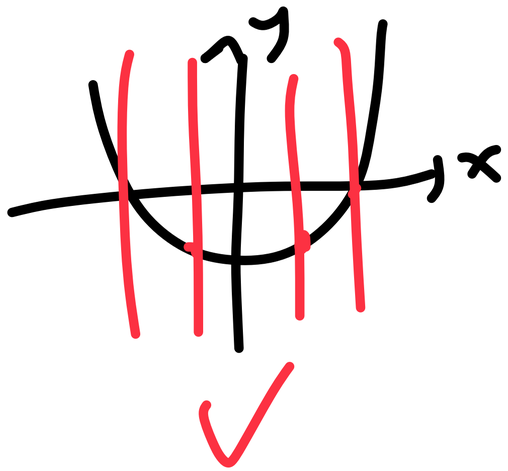
✗ $f: \mathbb{R} \to \mathbb{R} \quad f(x)=\sqrt{x+2}$

$0 \to \sqrt{2}$

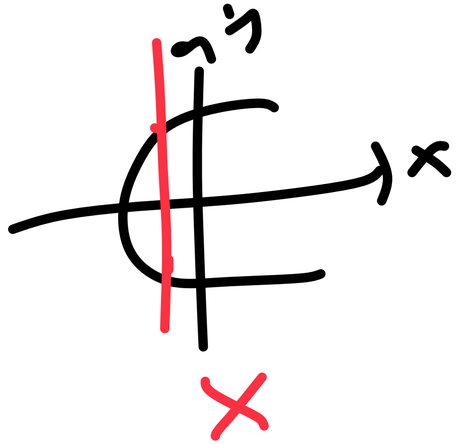
$-5 \to$ ~~$\sqrt{-3}$~~

Dikey Doğru Testi:

↳ y eks. çizilen paralel doğrular graf. **tek** bir nok...



✓



✗

Fonk. Sayısı:

↳ Formül var ama bilmeye gerek yok.

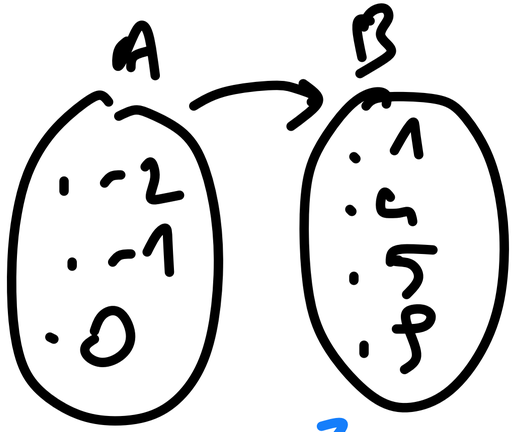
7 $A=\{-2,-1,0\}$

$B=\{1,4,5,8\}$

Olm. ü.

$f: A \to B$

$x^2 \leq f(x)$ o.ş. kaç f?



$3 \cdot 4 \cdot 4 = 48$

$f(2)^2 \leq f(-2)$

$4 \leq f(-2)$

$f(1)^2 \leq f(-1)$

$1 \leq f(-1)$

7 $f(x) = 5x^2 + 3$

$f(4) = 5 \cdot 4^2 + 3 = \dots$

$f(x+1) = 5 \cdot (x+1)^2 + 3 = \dots\dots$

ÖDEV:

$f\left(x + \frac{1}{x}\right) = x^2 + \frac{1}{x^2} + 3$

$f(7) = ?$

7 $f(4x - x^2) = 2x^2 - 8x + 4$

$f(6) = ?$

$f(\underbrace{4x - x^2}_{a}) = -2 \cdot (\underbrace{4x - x^2}_{a}) + 4$

$f(0) = -2 \cdot a + 4$ .....

7 $f(\sin x + \cos x) = \sin x \cdot \cos x$

$$\frac{f\left(\frac{1}{5}\right)}{f\left(-\frac{1}{5}\right)} = ?$$

$$\sin x + \cos x = \frac{1}{5}$$

$$\sin^2 x + 2\sin x \cdot \cos x + \cos^2 x = \frac{1}{25}$$

$$\sin x \cdot \cos x = -\frac{24}{50}$$

$$\frac{-\frac{24}{50}}{-\frac{24}{50}} = 1 \text{ //}$$

$$\therefore f\left(\frac{1}{5}\right) = -\frac{24}{50}$$

7 $f\left(\frac{1}{1-x}\right) + f(x) = 2x+2$

$f(2) = ?$

$\frac{9}{2}$

$f(-1) + f(2) = 6$

$-1 \quad f\left(\frac{1}{2}\right) + f(-1) = 0$

$+ \quad f(2) + f\left(\frac{1}{2}\right) = 3$

$2f(2) = 9$

En Genis T.K

Ex :

* $P(x) = a_0 + a_1 x + \dots + a_n x^n$

R

* $f(x) = \frac{P(x)}{Q(x)}$ $\quad R - \{Q(x) = 0\}$

* $f(x) = \sqrt[n]{g(x)} \begin{cases} n \text{ cift}, g(x) \geq 0 \\ n \text{ tek}, R \end{cases}$

$\log_a b$

i) $b > 0$

ii) $a > 0, a \neq 1$

T $f(x) = \sqrt{12 - |x-3|}$

en geniş T.K. x lerin top.?

② $\sqrt{12 - |x-3|}$

$12 - |x-3| \geq 0$

$12 \geq |x-3|$

$12 \geq x-3 \geq -12$

$15 \geq x \geq -9$ - - - -

Fonk. Dört işlem :

A ile B ayrık olmayan iki küme

$$f : A \to \mathbb{R}$$

$$g : B \to \mathbb{R}$$

- $f \mp g : A \cap B \to \mathbb{R}$, $(f \mp g)(x) = f(x) \mp g(x)$
- $f \cdot g : A \cap B \to \mathbb{R}$, $(f \cdot g)(x) = f(x) \cdot g(x)$
- $\frac{f}{g} : A \cap B \to \mathbb{R}$, $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$, $(g(x) \neq 0)$

T $f: \mathbb{R} \to \mathbb{R}$, $g: \mathbb{R} \to \mathbb{R}$

$f(x) = 2x + 3$, $g(x) = 5x - 3$

$(f + g)(1) = f(1) + g(1) = \cdots$

$(f - 2g + 4)(3) = f(3) - 2g(3) + 4$

$= \cdots\cdots$

7 $f: \{-1, 0, 1\} \to \mathbb{R}$

$g: \{-4, 0, 1, 3\} \to \mathbb{R}$

$f(x) = 2x - 3$ $\qquad$ $g(x) = 5x + 4$

$(f+g)(x)$ fonk görüntü k.?

$(f+g)(x) = \{(0, 1), (1, 8)\}$

7 $f(x) = 3^x + 9 \Rightarrow f(x) - 9 = 3^x$

old.gre, $f(4x)$ fonk. $f(x)$ cins. esiti?

$f(4x) = 3^{4x} + 9$

$= (3^x)^4 + 9$

$= (f(x) - 9)^4 + 9$

7

$$f(x \cdot y) = f(x) + f(y) \Longrightarrow \underline{\log_a x} \quad \text{dir.}$$

$f(16) = 4$

old. gsre $\quad f(5) = ?$

$f(x) = \log_a x$

$\log_a 16 = 4$

$16 = a^4$

$\boxed{2 = a}$

$f(x) = \log_2 x$

$f(5) = \log_2 5$