

Composition de fonctions

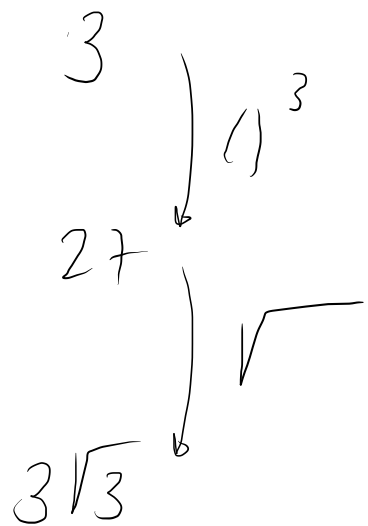
$$f(x) = x^2$$

$$g(x) = x$$

$$h(x) = \sqrt{x}$$

$$i(x) = x^3$$

$$\begin{aligned}(f+g)(x) &= f(x) + g(x) \\ &= x^2 + x\end{aligned}$$



Composer deux fonctions

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$$k(x) = \sqrt{x^3} = h(i(x))$$

Exemple:

$$a(x) = \frac{1}{x}$$

$$c(x) = x^2 + x + 1$$

$$b(x) = \sqrt{x}$$

On définit $d(x) = a(b(c(x)))$

$$d(x) = \frac{1}{\sqrt{x^2 + x + 1}}$$

Notation: Satz $f, g: \mathbb{R} \rightarrow \mathbb{R}$

$$f \circ g: \mathbb{R} \rightarrow \mathbb{R}$$

$$x \mapsto f(g(x))$$

$$\mathbb{R} \xrightarrow{g} \mathbb{R} \xrightarrow{f} \mathbb{R}$$

$$f \circ g(x) \in \text{ED}(f)$$

$$f \circ g(x) = f(g(x)) \quad \text{per def. } \forall x \in \text{ED}(g)$$

Example:

$$f(x) = x^3$$
$$g(x) = 1 - x - x^2$$

$$f \circ g(x) = f(g(x)) = f(1 - x - x^2)$$

$$= (1 - x - x^2)^3$$