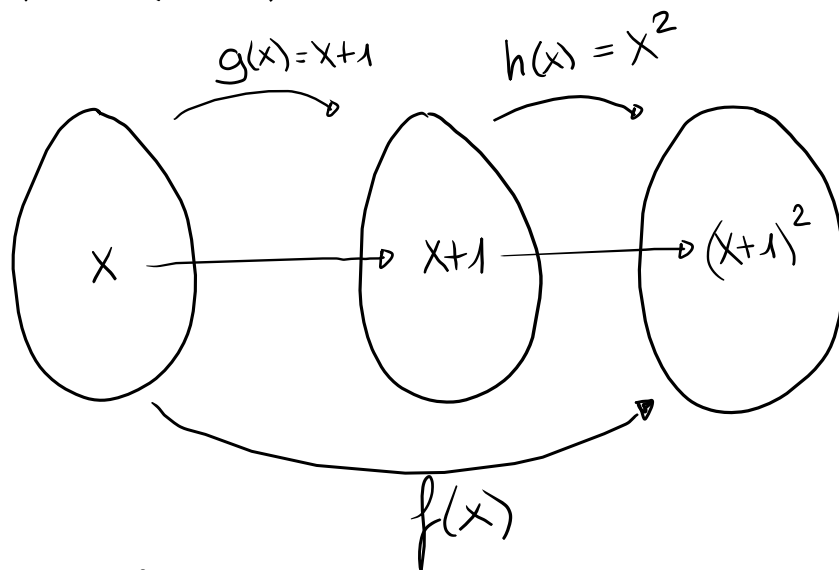
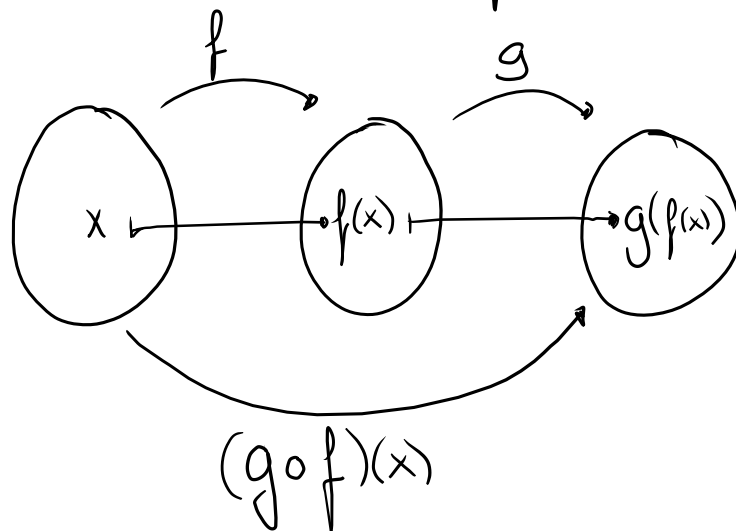


Composition de fonctions

Exple : 1) $f(x) = (x+1)^2$



Déf:



se lit "g rond f de x"

$g \circ f$ est la fonction composée de f et de g

$$(g \circ f)(x) = g(f(x))$$

Exemples : 1) suite : $f(x) = (x+1)^2 = (h \circ g)(x) = h(g(x)) = h(x+1) = (x+1)^2 \checkmark$

avec $g(x) = x+1$
 $h(x) = x^2$

$$(g \circ h)(x) = g(h(x)) = g(x^2) = x^2 + 1 \neq \underbrace{(x+1)^2}_{\substack{\text{PR} \\ x^2 + 2x + 1}} = (h \circ g)(x)$$

2) $f(x) = 2x$ et $g(x) = \frac{1}{x}$

$$(f \circ g)(x) = f\left(\frac{1}{x}\right) = 2 \cdot \frac{1}{x} = \frac{2}{x}$$

$$(g \circ f)(x) = g(2x) = \frac{1}{2x}$$

$$(f \circ f)(x) = f(2x) = 4x$$

$$(g \circ g)(x) = g\left(\frac{1}{x}\right) = x$$

3) $f(x) = 3x$ $g(x) = 2x-1$ $h(x) = \sqrt{x}$

$$(f \circ g \circ h)(x) = f(g(h(x))) = f(g(\sqrt{x})) = f(2\sqrt{x}-1) = 3(2\sqrt{x}-1) = 6\sqrt{x}-3$$

$ED(f \circ g \circ h) = \mathbb{R}_+^*$

$$(h \circ g \circ f)(x) = h(g(f(x))) = h(g(3x)) = h(6x-1) = \sqrt{6x-1}$$

$$ED(h \circ g \circ f) = \left[\frac{1}{6}; +\infty\right[$$

cond : $6x-1 \geq 0$

$6x \geq 1$

$x \geq \frac{1}{6}$

Ex 2.2.7 a) b)

2.2.8 a)