

# Composición.

$$5. \text{ Si } f: [0, +\infty) \rightarrow \mathbb{R}$$

$$x \mapsto 2 - |x|$$

$$g: (-\infty, 1) \rightarrow \mathbb{R}$$

$$x \mapsto x - x^2$$

Determine  $g \circ f$  y  $f \circ g$

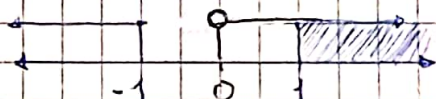
$$g \circ f = \{x: x \in \text{dom } f \wedge f(x) \in \text{dom } g\}$$

$$\equiv x \in [0, +\infty) \wedge 2 - |x| \in (-\infty, 1)$$

$$\equiv x \geq 0 \wedge 2 - |x| < 1$$

$$\equiv x \geq 0 \wedge |x| > 1$$

$$\equiv x \geq 0 \wedge (x > 1 \vee x < -1)$$



$$\equiv x \geq 0 \wedge x \in (-\infty, -1) \cup (1, +\infty)$$

$$x \in [1, +\infty)$$

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

$$= g(2 - |x|)$$

$$2 - |x| - (2 - |x|)^2$$

$$3|x| - x^2 - 2$$

$$g \circ f: [1, +\infty) \rightarrow \mathbb{R}$$

$$x \mapsto 3|x| - x^2 - 2$$

$$Si \quad f: [0, +\infty) \rightarrow \mathbb{R}$$

$$x \mapsto 2 - |x|$$

$$g: (-\infty, 1) \rightarrow \mathbb{R}$$

$$x \mapsto x - x^2$$

Determine  $g \circ f$  y  $f \circ g$

$$f \circ g: \quad E = \{x: x \in \text{dom } g \wedge g(x) \in \text{dom } f\}$$

$$x \in (-\infty, 1) \wedge x - x^2 \in [0, +\infty)$$

$$x < 1 \wedge x - x^2 \geq 0$$

$$x < 1 \wedge -x(x-1) \geq 0$$

$$\begin{array}{c} \downarrow \quad \downarrow \\ 0 \quad 1 \\ -\infty \quad 0 \quad 1 \quad +\infty \end{array}$$

$-x$	$>$	$<$	$<$
$x-1$	$<$	$<$	$>$
	$<$	$>$	$<$

$$x \in (-\infty, 1) \wedge -x(x-1) \in [0, 1]$$

$$x \in [0, 1]$$

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

$$f(x - x^2)$$

$$2 - |x - x^2|$$

$$f \circ g: [0, 1] \rightarrow \mathbb{R}$$

$$x \mapsto 2 - |x - x^2|$$