

# Is Composition always Possible?

❑ Not any two functions can be composed.

○  $f(x) = -|x|$  (domain and codomain are both  $\mathbb{R}$ ).

○  $g(x) = \sqrt{x}$  (domain and codomain are both  $\mathbb{R}_+$ ).

○  $(g \circ f)(x) = g(f(x)) = g(-|x|) = \sqrt{-|x|}$  (**undefined!**)

❑  $g \circ f$  is well defined only if **the range of  $f$  is a subset of the domain of  $g$ .**