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Homework: (8/14/2024):

In Exercises 27-34, calculate the composite functions $f \circ g$ and $g \circ f$, and determine their domains.

27. $f(x) = \sqrt{x}$, $g(x) = x + 1$

$f(g(x)) = \sqrt{x+1}$
 $g(f(x)) = \sqrt{x} + 1$

Domain: $x \in [-1, \infty)$
 $x \in [0, \infty)$

29. $f(x) = 2^x$, $g(x) = x^2$

$f(g(x)) = 2^{x^2}$
 $g(f(x)) = (2^x)^2 = 2^{2x} = 4^x$

Domain: $x \in \mathbb{R}$
 $x \in \mathbb{R}$

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33. $f(t) = \frac{1}{\sqrt{t}}$, $g(t) = -t^2$

$f(g(t)) = \frac{1}{\sqrt{-t^2}}$
 $g(f(t)) = -\left(\frac{1}{\sqrt{t}}\right)^2$

Domain: $x \neq 0$
 $x \in (0, \infty)$