

8. Given $f(x-1) = \ln \frac{x^2+1}{x^2-3}$, if $f(g(x)) = x^2$, then what is the domain of $g(x)$?

$$f(x-1) = \ln \left(1 + \frac{4}{x^2-3} \right)$$

$$\frac{4}{x^2-3} \neq 0$$

$$1 + \frac{4}{x^2-3} \neq 1$$

$$f(x-1) = \ln \left(1 + \frac{4}{x^2-3} \right) \neq 0$$

$$f(x) \neq 0$$

$$f(g(x)) = x^2 \neq 0$$

$$x \neq 0$$

The domain of $g(x)$ is $(-\infty, 0) \cup (0, +\infty)$.