Exercise 10

Given $f(x) = \sqrt{x}$ and $g(x) = |x - 3|$, find $\frac{g}{f}$. Determine the domain of the function in interval notation.

Solution

Start by writing the function.

$$\frac{g}{f} = \frac{g(x)}{f(x)} = \frac{|x - 3|}{\sqrt{x}}$$

Only the square root of a nonnegative number may be taken, and the denominator cannot be zero.

$$x \geq 0 \quad \text{and} \quad \sqrt{x} \neq 0$$

Square both sides of the equation on the right.

$$x \geq 0 \quad \text{and} \quad x \neq 0$$

Combine the two conditions.

$$x > 0$$

Therefore, the domain is $(0, \infty)$.