Exercise 16

For the following exercises, find the domain of each function using interval notation.

$$f(x) = \frac{\sqrt{x+4}}{x-4}$$

Solution

You cannot take the square root of a negative number or divide by zero, so it's necessary that

$$x + 4 \geq 0 \quad \text{and} \quad x - 4 \neq 0$$

Solve for x.

$$x \geq -4 \quad \text{and} \quad x \neq 4$$

Therefore, the domain is $[-4, 4) \cup (4, \infty)$. This is reflected in the graph of $f(x)$ versus x.