Exercise 21

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

$$f(x) = \frac{x-3}{x^2-4x-12}$$

Solution

The denominator of a rational function cannot be zero.

$$x^2 - 4x - 12 \neq 0$$

Solve for x by factoring.

$$(x-6)(x+2) \neq 0$$

$$x - 6 \neq 0 \quad \text{or} \quad x + 2 \neq 0$$

$$x \neq 6 \quad \text{or} \quad x \neq -2$$

Therefore, the domain is

$$(-\infty, -2) \cup (-2, 6) \cup (6, \infty).$$