

Exercise 21

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

$$f(x) = \frac{2x + 1}{\sqrt{5 - x}}$$

Solution

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

$$5 - x \geq 0 \quad \text{and} \quad \sqrt{5 - x} \neq 0.$$

Solve for x .

$$-x \geq -5 \quad \text{and} \quad 5 - x \neq 0$$

$$x \leq 5 \quad \text{and} \quad x \neq 5$$

Combine these two conditions.

$$x < 5$$

Therefore, the domain is $(-\infty, 5)$. This is reflected in the graph of $f(x)$ versus x .

