

Objective: Students will be able to find the domain of a function algebraically and graphically. Students will find the range of a function graphically. Students will attend to precision when writing solutions using proper notation.

Finding the Domain

Algebraically:

1) When is the denominator 0?

$$f(x) = \frac{5}{x-12}$$

$$x-12=0$$

$$x=12$$

$$D: \{x \mid x \neq 12\}$$

2) When is the value under a square root negative?

$$g(x) = \sqrt{x+4}$$

$$x+4 \geq 0$$

$$x \geq -4$$

$$D: \{x \mid x \geq -4\}$$

Think about this...

This is the domain

Think about this

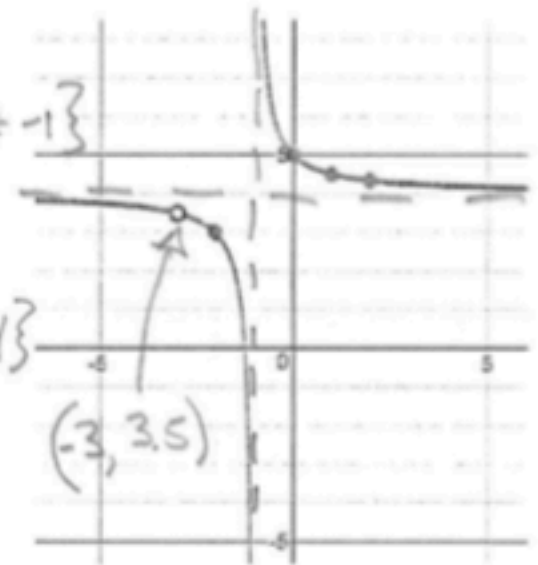
This is the domain

Graphically:

What are the boundaries for the x-values in the graph? Are there holes (open circles) or asymptotes in the graph?

$$D: \{x \mid x \neq -3, x \neq -1\}$$

$$R: \{y \mid y \neq 3.5, y \neq 4\}$$



Find the domain of the following functions.

a) $h(x) = \sqrt{x+8}$

$$x+8 \geq 0$$

$$x \geq -8$$

$$D: \{x \mid x \geq -8\}$$

b) $f(x) = \frac{5x}{x^2-9x+20}$

$$x^2-9x+20=0$$

$$\begin{array}{r} 20 \\ -4x \quad -5x \\ +8x \end{array}$$

-4	-4x	20
x	x ²	-5x

$$(x-4)(x-5)=0$$

$$x=4 \quad x=5$$

$$D: \{x \mid x \neq 4, x \neq 5\}$$

c) $g(x) = \frac{(x+5)}{(x+5)(x-3)}$

$$g(x) = \frac{1}{x-3}$$

$$D: \{x \mid x \neq 3, x \neq -5\}$$