

Name: _____

Date: _____

Notes: Domain and Range 2.0

Do Now:

1) Find the value(s) of x that will make the following function undefined.

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

2) Find all the real values of x that will make the following function imaginary.

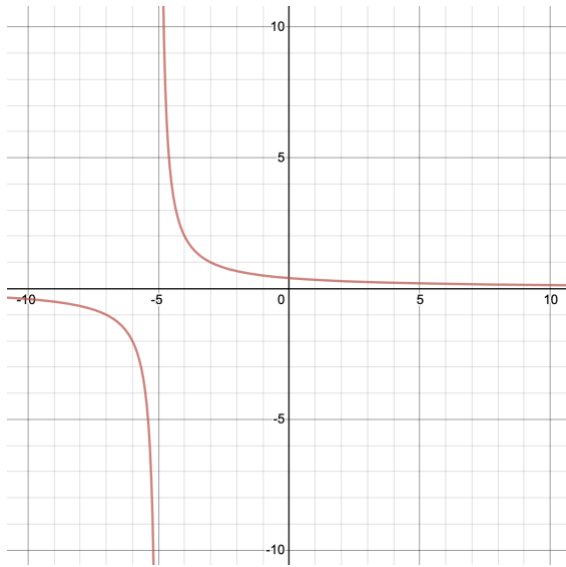
$$f(x) = \sqrt{2x - 20}$$

What Should I Be Able to Do?

- I can algebraically find the domain and range of linear and square root equations.
- I can algebraically find the domain of rational equations.

Let's take a look at the graphs of the functions in our Do Now:

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

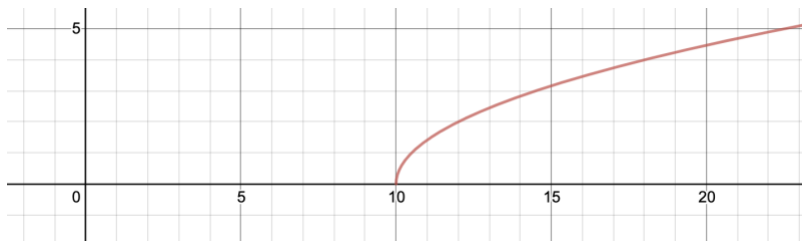


How does the graph of $f(x) = \frac{2}{x+5}$ show us the domain of the function?

How does the (x,y) table of $f(x) = \frac{2}{x+5}$ support our findings?

What is the range of $f(x) = \frac{2}{x+5}$?

2) $f(x) = \sqrt{2x - 20}$



How does the graph of $f(x) = \sqrt{2x - 20}$ show us the domain of the function?

How does the (x,y) table of $f(x) = \sqrt{2x - 20}$ support our findings?

What is the range of $f(x) = \sqrt{2x - 20}$?

Determine the domain of the function $f(x) = \frac{3x}{x+1}$.

Determine the domain and range of the function $f(x) = 2x + 1$.

Determine the domain and range of the function $f(x) = \sqrt{x - 3}$.

Determine the domain of the function $f(x) = \frac{1}{\sqrt{x-3}}$.

Determine the domain of the function $f(x) = \frac{\sqrt{x-2}}{x-7}$.

Determine the domain of the function $f(x) = \frac{\sqrt{x+5}}{\sqrt{x-4}}$.

Checkpoint:

Find the domain and range of each function.

1) $f(x) = \sqrt{x + 13.5}$

2) $2y - 14x = -\frac{8}{7} + 19x$

Find the domain of each function.

3) $f(x) = \frac{x-7}{x+14}$

4) $f(x) = \frac{3x-4}{\sqrt{4x-23}}$

5) $f(x) = \frac{\sqrt{x}}{x-6}$

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

Success Criteria

- I can algebraically find the domain and range of linear and square root equations.

Find the domain and range of each function.

1) $f(x) = \frac{14}{3}x - 1$

2) $f(x) = \sqrt{3x + 20}$

- I can algebraically find the domain of rational equations.

Find the domain of each function.

1) $f(x) = \frac{3x}{5x-6}$

2) $f(x) = \frac{x-1}{\sqrt{6x+15}}$

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Classwork: Domain and Range 2.0

Find the domain and range of each function.

1) $f(x) = 2\sqrt{\frac{3}{2}x + 5}$

2) $x = \frac{1}{3}y + 5$

Find the domain of each function.

3) $f(x) = \frac{x-7}{x}$

4) $f(x) = \frac{2x + \frac{1}{3}}{\sqrt{x-15}}$

5) $f(x) = \frac{\sqrt{x}}{\sqrt{x-7}}$

6) $f(x) = \frac{\sqrt{x+8}}{2x - \frac{3}{4}}$

7) Sketch the graph of $f(x)$ using the following information.

- $f(x)$ is decreasing on interval $(-\infty, 5)$
- $f(5) = 1$
- $f(x)$ is increasing on interval $(5, \infty)$

Completely simplify each expression.

8) $\left(\frac{74x^{-15}y^5z^{-1/6}}{4y^{-8}z^{8/6}}\right)^{-2}$

9) $\sqrt[3]{-\frac{1}{343}x^{20}y^{33}z^{70}}$

10) $\frac{(\frac{1}{64})^{-2/3} - (2)^{3/2}}{(-16)^{3/4} - (2)^{5/2}}$

Solve each of the following equations.

$$11) -3x^{\frac{3}{2}} = -24$$

$$12) -\frac{4}{5}(x+9)^{\frac{5}{3}} + 1 = -79,999$$

13) Solve the following system of equations.

$$3x + 7y + z = -6$$

$$-5x - 6y - 4z = 33$$

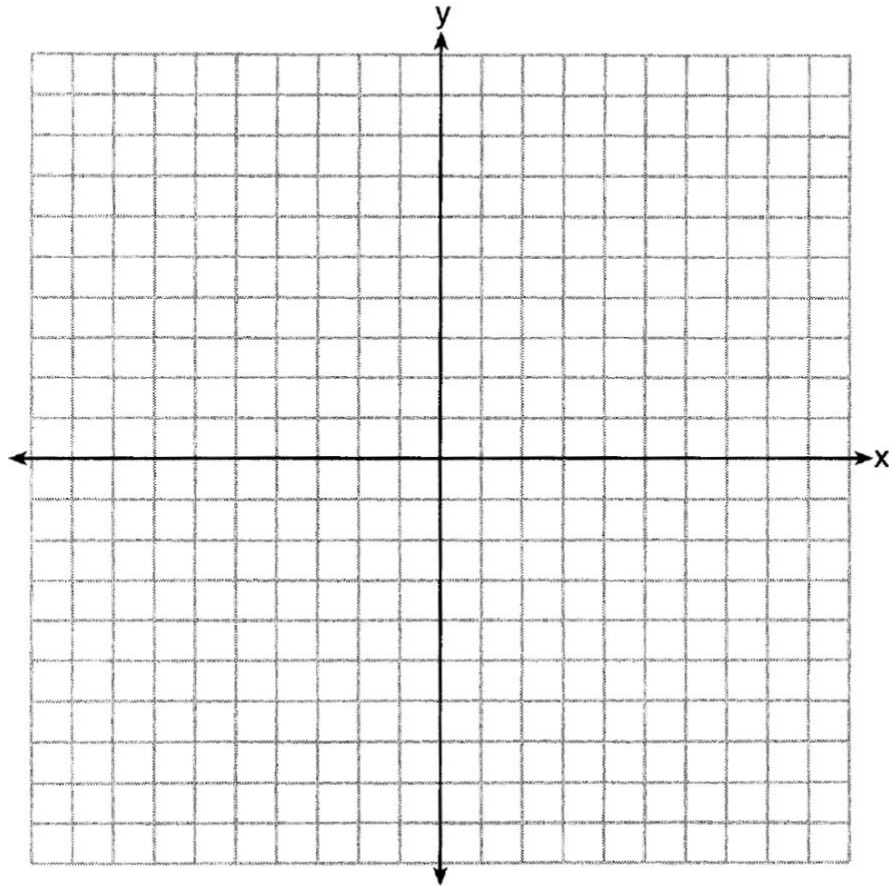
$$4x - 3y + 9z = -71$$

14)

Graph the following system of inequalities on the set of axes below:

$$2y \geq 3x - 16$$

$$y + 2x > -5$$



Based upon your graph, explain why $(6,1)$ is a solution to this system and why $(-6,7)$ is *not* a solution to this system.

15)

Given that $f(x) = 2x + 1$, find $g(x)$ if $g(x) = 2[f(x)]^2 - 1$.

16) Completely simplify the following expression.

$$-5i^{102} + 6.25i^{41} + \frac{17}{3}i^{28} - i^{1,123}$$

17) Solve for f in the equation below.

$$\frac{a + b}{c} = \frac{d + e}{f}$$