

HW 6.1 Answers

Go to back of HW 6-2 instructions. **Circle** 'Determine if a function'. Then add: **State yes or no for each.**

After checking hw, do the warmup in your 6-2 notes :)

1. no; 3 repeats
2. yes
3. yes
4. no; fails the vertical line test
5. yes
6. no; circle, fails the vertical line test
7. $h(-4) = -14$
8. $g(-2) = -7$
9. $f(-3) = 5/7$
10. $k(-3) = 9$
11. $f(n + 2) = 2n - 1$
12. $h(n + 1) = n^2 + 2$
13. $g(n-1) = 4n^2 - 4n + 1$
14. $k(2n + 1) = -6n - 1$

Jan 3-8:24 PM

In 1 - 4, determine if the relation is a function. If it is not, explain why it is not a function.

1. $\{(3, 2), (-9, 0), (3, -3), (1, -2)\}$
 NO. 3 repeats
2. $y = x^3 - 1$
3.
 yes
4.
 No. Fails vertical line test.
5. $y = |x - 2| + 1$

 yes
6. $(x - 1)^2 + (y + 4)^2 = 9$
 NO. Circle.
 Fails vertical line test

Evaluate each of the following:

7. $h(x) = 3x - 2$, find $h(-4)$
 $h(-4) = 3(-4) - 2$
 $h(-4) = -14$
8. $g(x) = -x^2 - 3$, find $g(-2)$
 $g(-2) = -(-2)^2 - 3$
 $= -4 - 3$
 $= -7$
9. $f(x) = \frac{2x+1}{3x+2}$, find $f(-3)$
 $f(-3) = \frac{2(-3)+1}{3(-3)+2}$
 $f(-3) = \frac{-5}{-7} = \frac{5}{7}$
10. $k(x) = 2\sqrt{1-x} + 5$, find $k(-3)$
 $k(-3) = 2\sqrt{1+3} + 5$
 $k(-3) = 2(2) + 5$
 $k(-3) = 9$

Jan 11-8:43 PM

11. $f(x) = 2x - 5$, find $f(n+2)$

$$f(n+2) = 2(n+2) - 5$$

$$f(n+2) = 2n - 1$$

12. $h(x) = (x-1)^2 + 2$, find $h(n+1)$

$$h(n+1) = (n+1-1)^2 + 2$$

$$h(n+1) = n^2 + 2$$

13. $g(x) = (2x+1)^2$, find $g(n-1)$

$$g(n-1) = (2(n-1)+1)^2$$

$$g(n-1) = (2n-1)^2$$

$$g(n-1) = 2n(2n-1) - 1(2n-1)$$

$$g(n-1) = 4n^2 - 2n - 2n + 1$$

$$g(n-1) = 4n^2 - 4n + 1$$

14. $k(x) = 2 - 3x$, find $k(2n+1)$

$$k(2n+1) = 2 - 3(2n+1)$$

$$k(2n+1) = -6n - 1$$

Jan 11-8:44 PM

$\underline{1 \leq 8 \leq 3}$

Warm-Up: $f(x) = -x^2 + 3x$ find $f(2x-1)$

Aside:

$$(2x-1)^2 =$$

$$(2x-1)(2x-1)$$

$$2x(2x-1) - 1(2x-1)$$

$$4x^2 - 4x + 1$$

$$f(2x-1) = -(2x-1)^2 + 3(2x-1)$$

$$f(2x-1) = -4x^2 + 4x - 1 + 6x - 3$$

$$f(2x-1) = -4x^2 + 10x - 4$$

Jan 3-3:42 PM

Unit 6

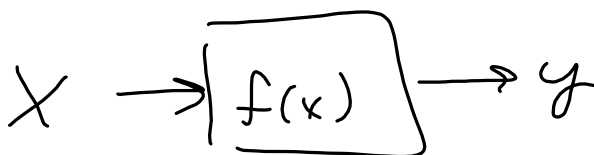
Day 2

Domain & Range

Jan 3-3:41 PM

Domain - The domain of a function is the set of all x-values (inputs), independent variable

Range - The range of a function is the set of all y-values (outputs), dependent variable



Jan 3-3:42 PM

For the following relations, state the domain and range.

Determine (yes or no) if the relation is a function.

1. $\{(3, 2), (5, 7), (1, 4), (9, 2), (3, 7)\}$
 Domain: $\{3, 5, 1, 9\}$ ~~(1, 2)~~
 Range: $\{2, 7, 4\}$
 Function? No, $x=3 \rightarrow 2$ and 7

2. $\{(6, 2), (3, 5), (9, 0), (5, 7), (8, 5)\}$
 Domain: $\{6, 3, 9, 5, 8\}$
 Range: $\{2, 5, 0, 7\}$
 Function? yes

Jan 3-3:43 PM

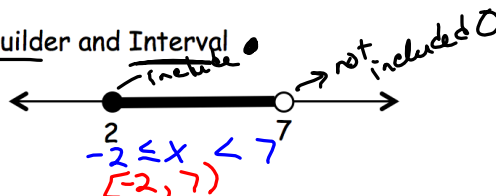
3. $\{(1, 1), (2, 3), (3, 4), (4, 2), (5, 1)\}$
 Domain: $\{1, 2, 3, 4, 5\}$
 Range: $\{1, 3, 4, 2\}$
 Function? yes

4. $\{(6, 1), (9, 2), (6, 8), (9, 7), (-8, 3)\}$
 Domain: $\{6, 9, -8\}$
 Range: $\{1, 2, 8, 7, 3\}$
 Function? No, $6 \rightarrow 1$ and 8 , $9 \rightarrow 2$ and 7

Jan 3-3:46 PM

Two Types of Notation: Set-Builder and Interval

Given the number line graph:

Set-Builder → $\{x | -2 \leq x < 7\}$ Read: The set of all x such that -2 is less than or equal to x and x is less than 7 Interval Notation → Parentheses and/or brackets are used to show whether the endpoints are excluded or included. For example, $[2, 7)$ is the **interval** of real numbers between 2 and 7 , including 2 and excluding 7 .

Jan 3-3:47 PM

Interval Notation

① $[-3, 4)$

② $(-1, 5]$

③ $(-\infty, 2) \text{ or } (4, \infty)$

④ $(-\infty, \infty)$

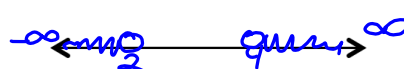
Set-Builder Notation

$\{x | -3 \leq x < 4\}$

$\{x | -1 < x \leq 5\}$

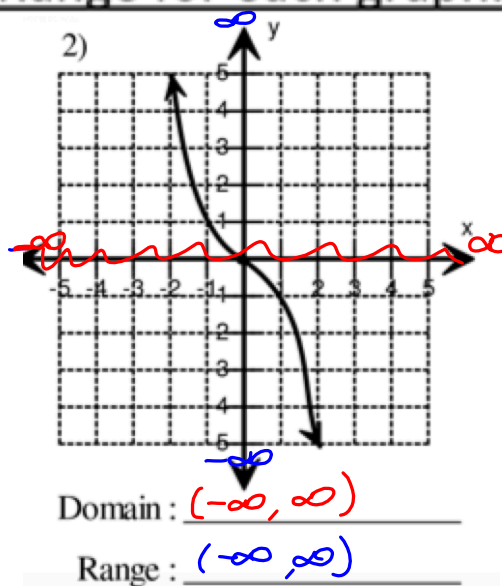
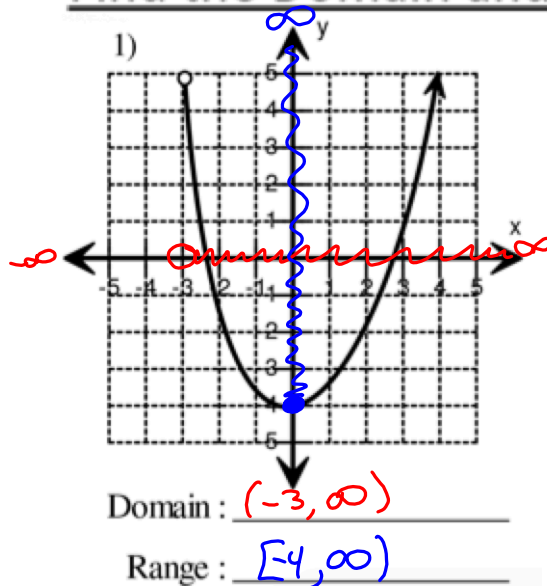
$\{x | x < 2 \text{ or } x > 4\}$

$\{x | x \in \mathbb{R}\}$

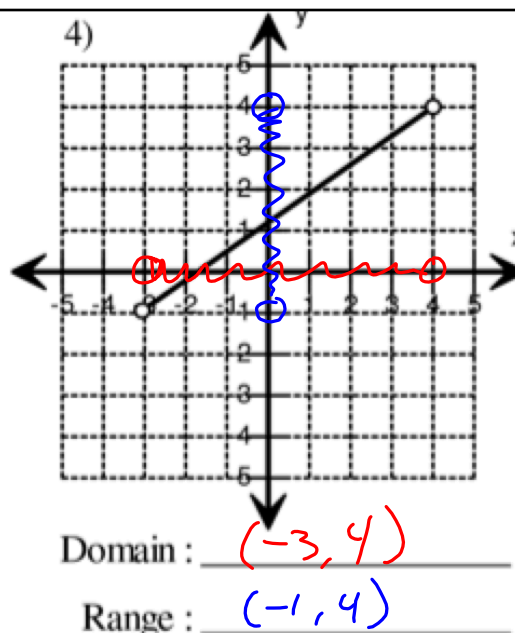
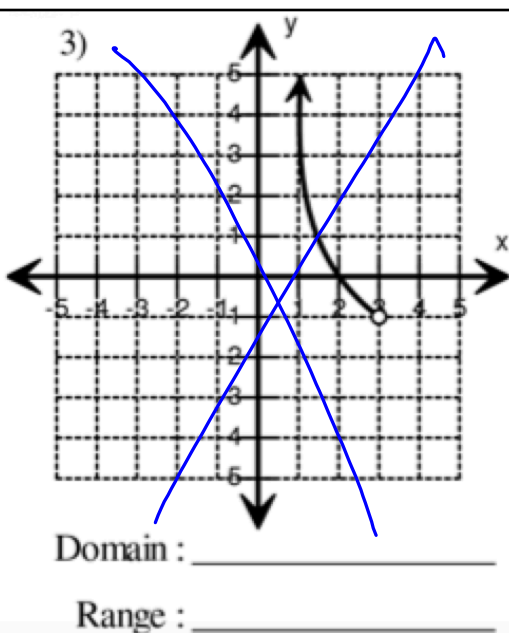
Number Line Graph

Jan 3-3:47 PM

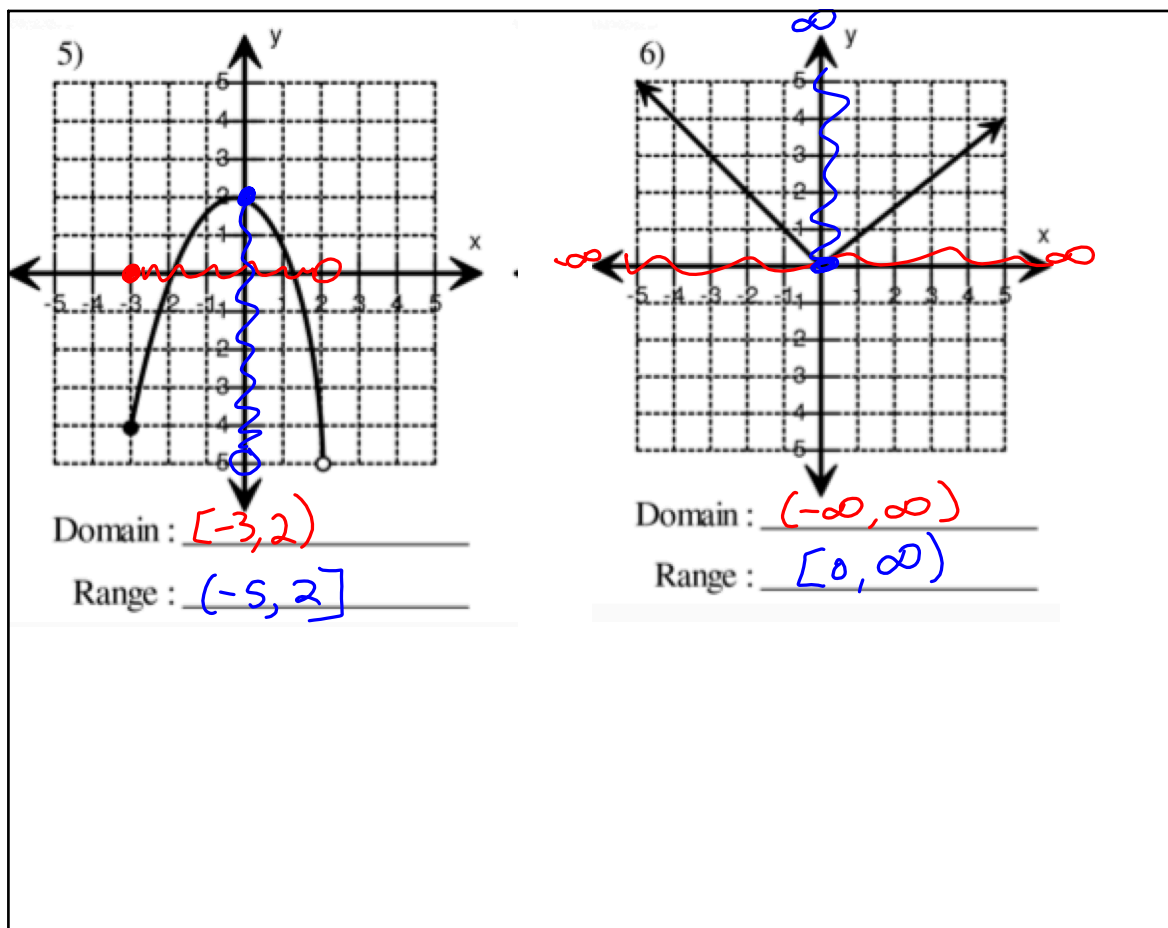
Find the Domain and Range for each graph. ^{x's} ^{y's}



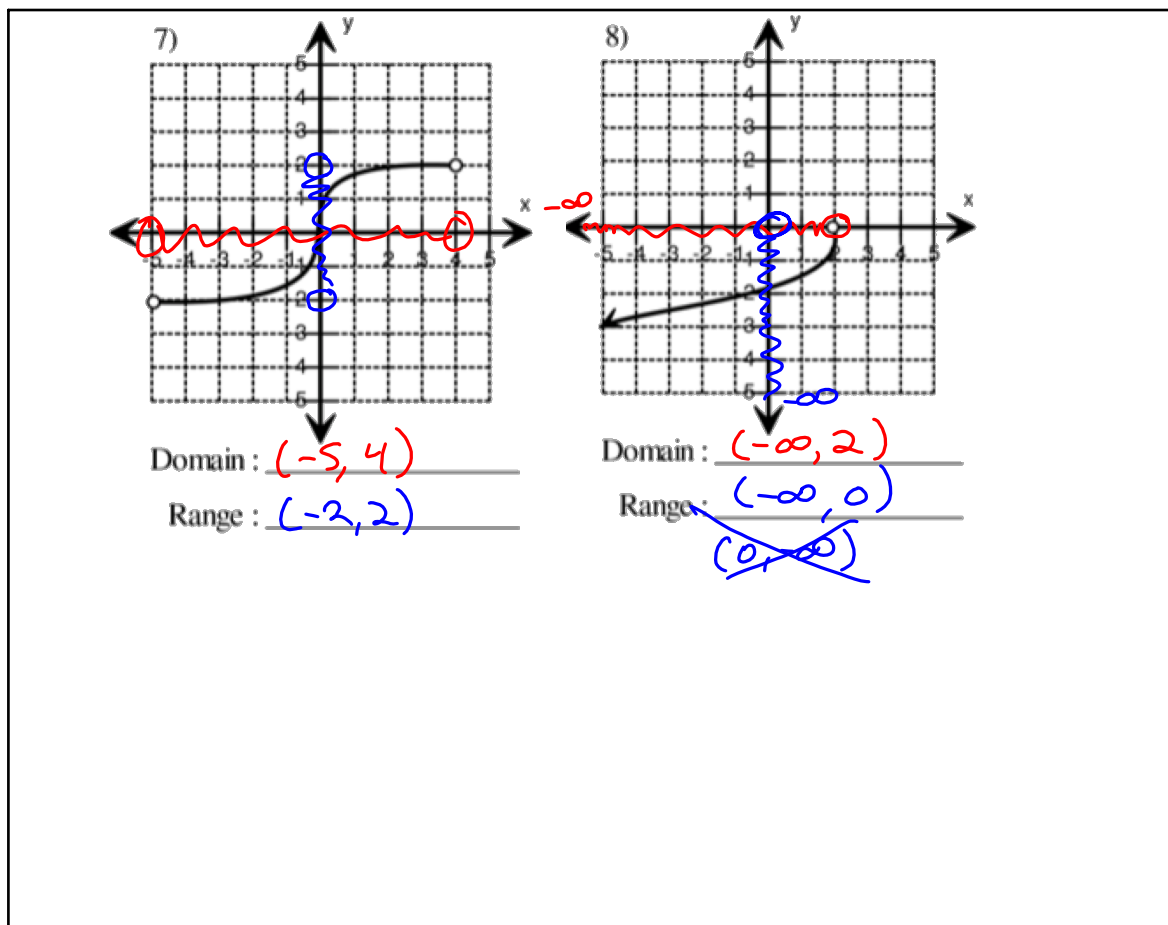
Jan 3-3:47 PM



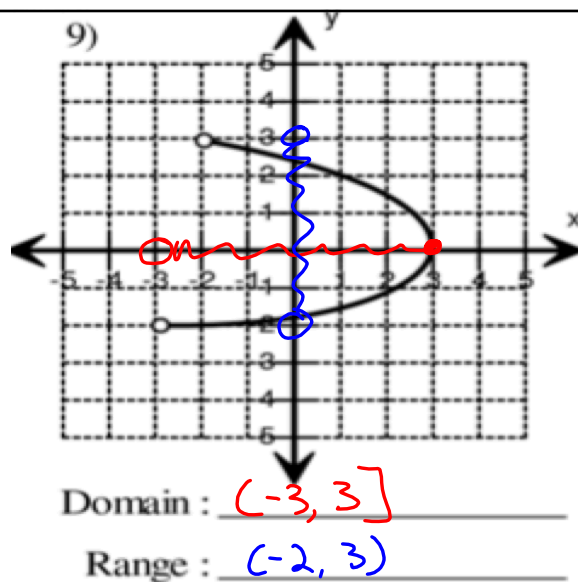
Jan 3-3:51 PM



Jan 3-3:50 PM



Jan 3-3:52 PM



Jan 3-3:52 PM

Day 4

Domain and Range
Algebraically

Jan 13-8:09 PM

Algebraically - 3 problem types

1. Variable in the Denominator
To Solve: Set Denominator $\neq 0$
Domain Looks Like: $x \neq$ _____

$$\frac{1}{x} \quad x \neq 0$$

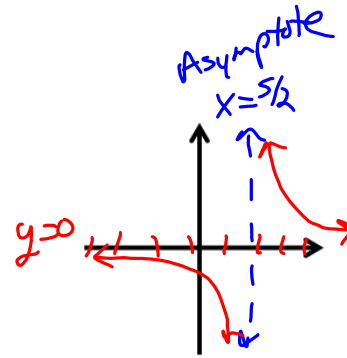
denom $\neq 0$

Example: $y = \frac{3}{2x-5}$

$$\begin{aligned} 2x-5 &\neq 0 \\ 2x &\neq 5 \\ x &\neq \frac{5}{2} \end{aligned}$$

Sketch:

$$D: \{x | x \neq \frac{5}{2}\}$$



2. Variable Under a Radical
To Solve: Radicand ≥ 0

Domain Looks Like: $x \geq$ _____ or $x \leq$ _____

Example: $y = \sqrt{2x-5}$

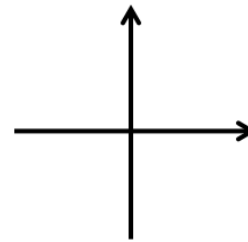
$$2x-5 \geq 0$$

$$2x \geq 5$$

$$x \geq \frac{5}{2}$$

Sketch:

$$\{x | x \geq \frac{5}{2}\}$$



Jan 4-8:06 PM

3. "Double Trouble" $\rightarrow$ Variable Under a Radical in the Denominator

To Solve: Radicand > 0 Domain Looks Like: $x >$ _____ or $x <$ _____

Example: $y = \frac{3}{\sqrt{2x-5}}$

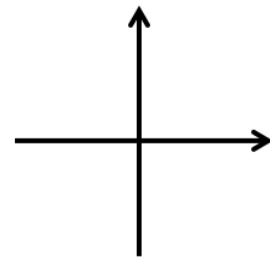
$$2x-5 > 0$$

$$2x > 5$$

$$x > \frac{5}{2}$$

Sketch:

$$\{x | x > \frac{5}{2}\}$$



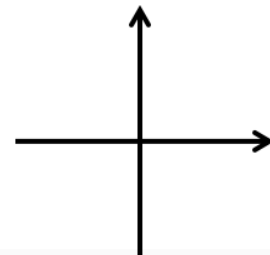
4. No Trouble $\rightarrow$ Nothing to Solve

Domain looks like $(-\infty, \infty)$ or $x \in \mathbb{R}$

Example: $y = 2x - 5$

Sketch:

$$\{x | x \in \mathbb{R}\}$$



Jan 4-8:08 PM

DOMAIN TROUBLE

$$\frac{1}{x}$$

$$x \neq 0$$

$$\sqrt{x}$$

$$x \geq 0$$

$$\frac{1}{\sqrt{x}}$$

$$x > 0$$

Nov 17-7:41 PM

Nov 18-1:27 PM