

HW 6.2 Answers

1. D: {1, 0, 3, -4, 7}
R: {9, 8, 0, -7}
Yes
2. D: {11, -6, 7, 9}
R: {3, 5, -1, 7}
No
3. D: {-3, -1, 0, 1, 2, 3}
R: {-3, -2, 0, 1, 2}
Yes
4. D: {blue, purple, red, green}
R: {2, 1}
Yes

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1. $\{(1, 9), (0, 8), (3, 0), (-4, 9), (7, -7)\}$
Domain: $\{1, 0, 3, -4, 7\}$
Range: $\{9, 8, 0, -7\}$
Function? YES

2. $\{(11, 3), (-6, 5), (7, -1), (9, 7), (7, 3)\}$
Domain: $\{11, -6, 7, 9\}$
Range: $\{3, 5, -1, 7\}$
Function? NO

3. Graph at below:
Domain: $\{-3, -1, 0, 1, 2, 3\}$
Range: $\{-3, -2, 0, 1, 2\}$
Function? YES

4. From the mapping below:
Domain: $\{\text{blue, purple, red, green}\}$
Range: $\{2, 1\}$
Function? YES

Fill in the missing information:

Interval Notation	Set-Builder Notation	Number Line Graph
$(-1, 2]$	$\{x -1 < x \leq 2\}$	
$(-\infty, -3]$ or $[7, \infty)$	$\{x x \leq -3 \text{ or } x > 7\}$	
$[3, 5]$	$\{x 3 \leq x \leq 5\}$	
$[-5, 9]$	$\{x -5 \leq x \leq 9\}$	

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Find the Domain and Range for each graph.

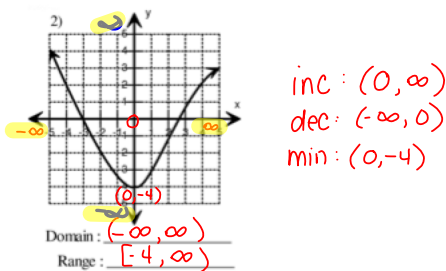
- 1) Domain: $(-\infty, 5]$ Range: $(-\infty, 2]$ YES
- 2) Domain: $(-\infty, 2)$ Range: $(-4, 4)$ YES
- 3) Domain: $(-4, \infty)$ Range: $(-1, \infty)$ YES
- 4) Domain: $(-\infty, 3]$ Range: $(-2, \infty)$ NO
- 5) Domain: $(-4, 3]$ Range: $(-5, 2]$ YES
- 6) Domain: $(-4, \infty)$ Range: $(0, \infty)$ YES
- 7) Domain: $(-5, 4]$ Range: $(-3, 3]$ YES
- 8) Domain: $(-\infty, 0]$ Range: $(-3, \infty)$ NO
- 9) Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ YES

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Domain and Range Algebraically

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Warm-Up: Find the domain, range, increasing, decreasing, relative min & relative max for number 2 on the warm-up sheet.



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Algebraically - 3 problem types

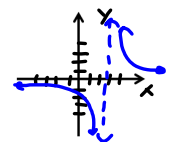
1. Variable in the Denominator

To Solve: Set Denominator = 0
Domain Looks Like: $x \neq$ _____

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

$2x-5=0$ $x \neq \frac{5}{2}$
 $x = \frac{5}{2}$

Sketch:



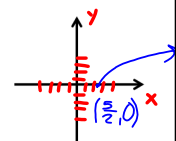
2. Variable Under a Radical

To Solve: Radicand ≥ 0
Domain Looks Like: $x \geq$ _____ or $x \leq$ _____

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

$2x-5 \geq 0$
 $x \geq \frac{5}{2}$

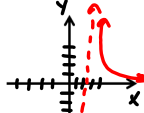
Sketch:



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3. "Double Trouble" → Variable Under a Radical in the Denominator
To Solve: Radicand > 0
Domain Looks Like: $x > \underline{\hspace{1cm}}$ or $x < \underline{\hspace{1cm}}$

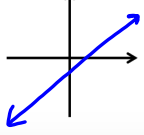
Example: $y = \frac{3}{\sqrt{2x-5}}$

Sketch: 

**If you have a variable in the denominator you will more than likely have an asymptote on your graph*

4. No Trouble → Nothing to Solve
Domain looks like $(-\infty, \infty)$ or $x \in \mathbb{R}$

Example: $y = 2x - 5$

Sketch: 

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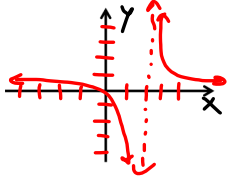
For each of the following,

- State the type of trouble.
- Find the domain algebraically.
- Sketch the graph.
- Use the graph to find the range.

1. $y = \frac{x}{x-2}$

a. variable in the denominator

b. $x-2=0$
 $x: 2 \quad x \neq 2$

c. 

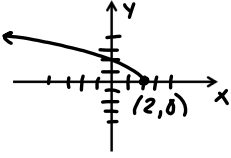
d. _____

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2. $y = \sqrt{4-2x}$

a. Variable under the radical

b. $4-2x \geq 0$
 $\underline{-4} \quad \underline{-4}$
 $\underline{-2x} \geq \underline{-4}$
 $\underline{-2} \quad \underline{-2}$
 $x \leq 2$

c. 

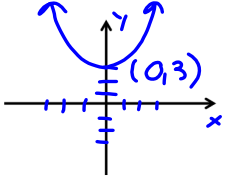
d. _____

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3. $y = x^2 + 3$

a. no trouble

b. $(-\infty, \infty)$

c. 

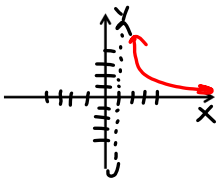
d. _____

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4. $y = \frac{2}{\sqrt{x-1}}$

a. double trouble

b. $x-1 > 0$
 $x > 1$

c. 

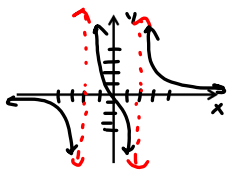
d. _____

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5. $y = \frac{x}{x^2-4}$

a. variable in the denominator

b. $x^2-4=0$
 $(x-2):0 \quad (x+2):0$
 $x: 2 \quad x: -2$
 $x \neq 2, x \neq -2$

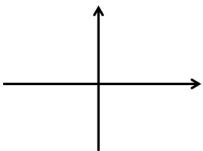
c. 

d. _____

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6. $y = \frac{4}{\sqrt{3-x}}$

a. _____

c. 

b. _____

d. _____

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Dec 3-7:44 AM