4.4

Algebra 2

Domain and Range given Graphs, and Functions

Domain: the set of x-values that can be put into a function.

Range: the set of y-values that come out of a function.

Set Builder Notation:

| stands for "such that"

$\in$ stands for "is an element of"

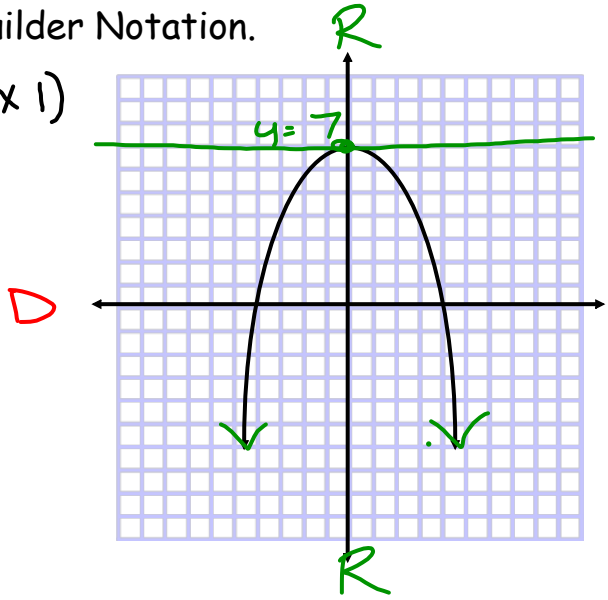
$\mathbb{R}$ stands for "all real numbers"

ex) $\{x|x>3\}$ which represents all x-values that are greater than 3.

ex) $\{y|y\in\mathbb{R}\}$ which represents all y-values that are in the set of real numbers.

Find the domain and range given a graph. Put answers in Set Builder Notation.

ex 1)

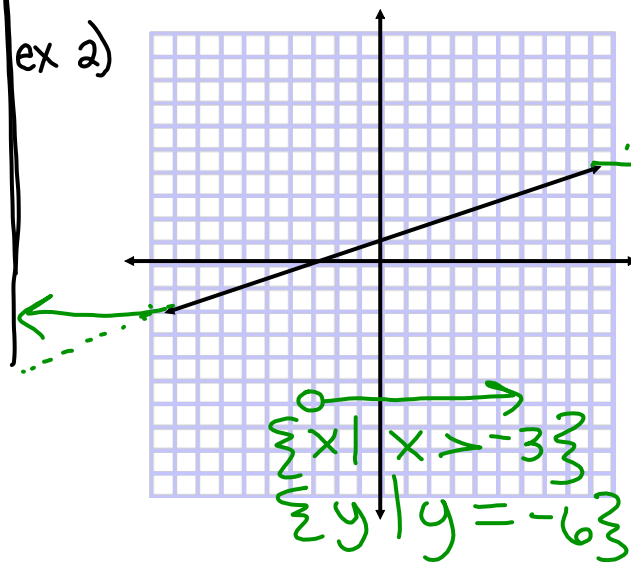


$D: \{x \mid x \in \mathbb{R}\}$

$R\{y \mid y \leq 7\}$

Find the domain and range given a graph. Put answers in Set Builder Notation.

ex 2)



$D: \{x \mid x \in \mathbb{R}\}$

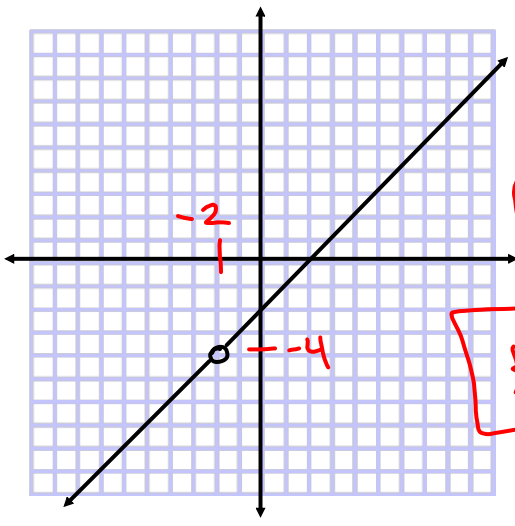
$R: \{y \mid y \in \mathbb{R}\}$

$\{x \mid x > -3\}$

$\{y \mid y = -6\}$

Find the domain and range given a graph. Put answers in Set Builder Notation.

ex 3)



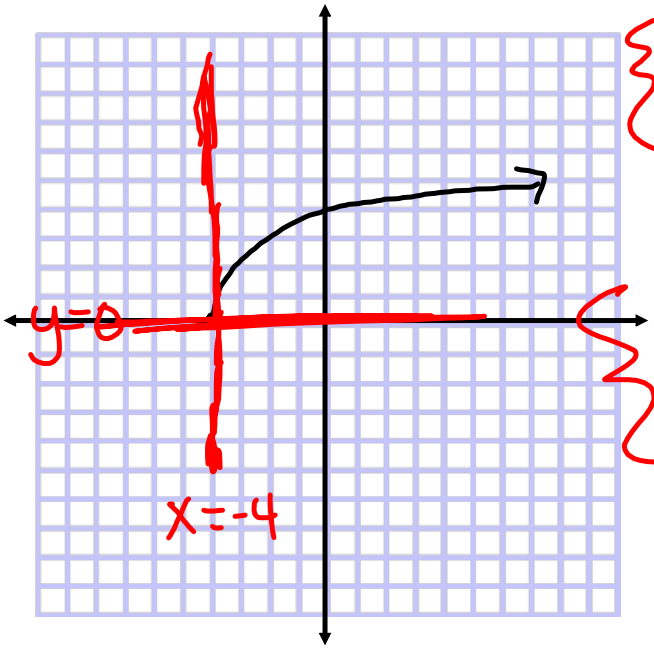
$D: \{x \mid x \in \mathbb{R} \neq -2$

$D\{x \mid x \neq 2\}$

$R: \{y \mid y \neq -4\}$

Try this:

Find the domain and range given a graph. Put answers in Set Builder Notation.



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

$\{y \mid y \geq 0\}$

Note 1: You cannot take the square root of a negative number in the real number system.

Note 2: You can NEVER divide by 0.

Find the domain and range given a function. Put answers in Set Builder Notation.

ex 1) $2x+4y=18$

$D: \{x \mid x \in \mathbb{R}\}$

$R: \{y \mid y \in \mathbb{R}\}$

ex 2) $\sqrt{x-4} = y$

$x-4 \geq 0$

$+4 \quad +4$

$x \geq 4$

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

ex 3) $\dfrac{4x}{9x^2-64} \neq 0$

$9x^2-64=0$

$+64 \quad +64$

$\dfrac{9x^2}{9} = \dfrac{64}{9}$

$\sqrt{x^2} = \sqrt{\dfrac{64}{9}}$

$x = \pm\dfrac{8}{3}$

$(3x-8)(3x+8)$

$8/3 \quad -8/3$

$D: \{x \mid x \neq \pm 8/3\}$

ex 4) $y = 4x^2+6x-10$

$D: \{x \mid x \in \mathbb{R}\}$

Try this:

Find the domain and ~~range~~ given a function. Put answers in Set Builder Notation.

1) $y = 4\sqrt{6x+2} + 3$

$6x + 2 \geq 0$

$-2 \quad -2$

$\frac{6x}{6} \geq \frac{-2}{6}$

$x \geq -\frac{1}{3}$

D: $\{x \mid x \geq -\frac{1}{3}\}$

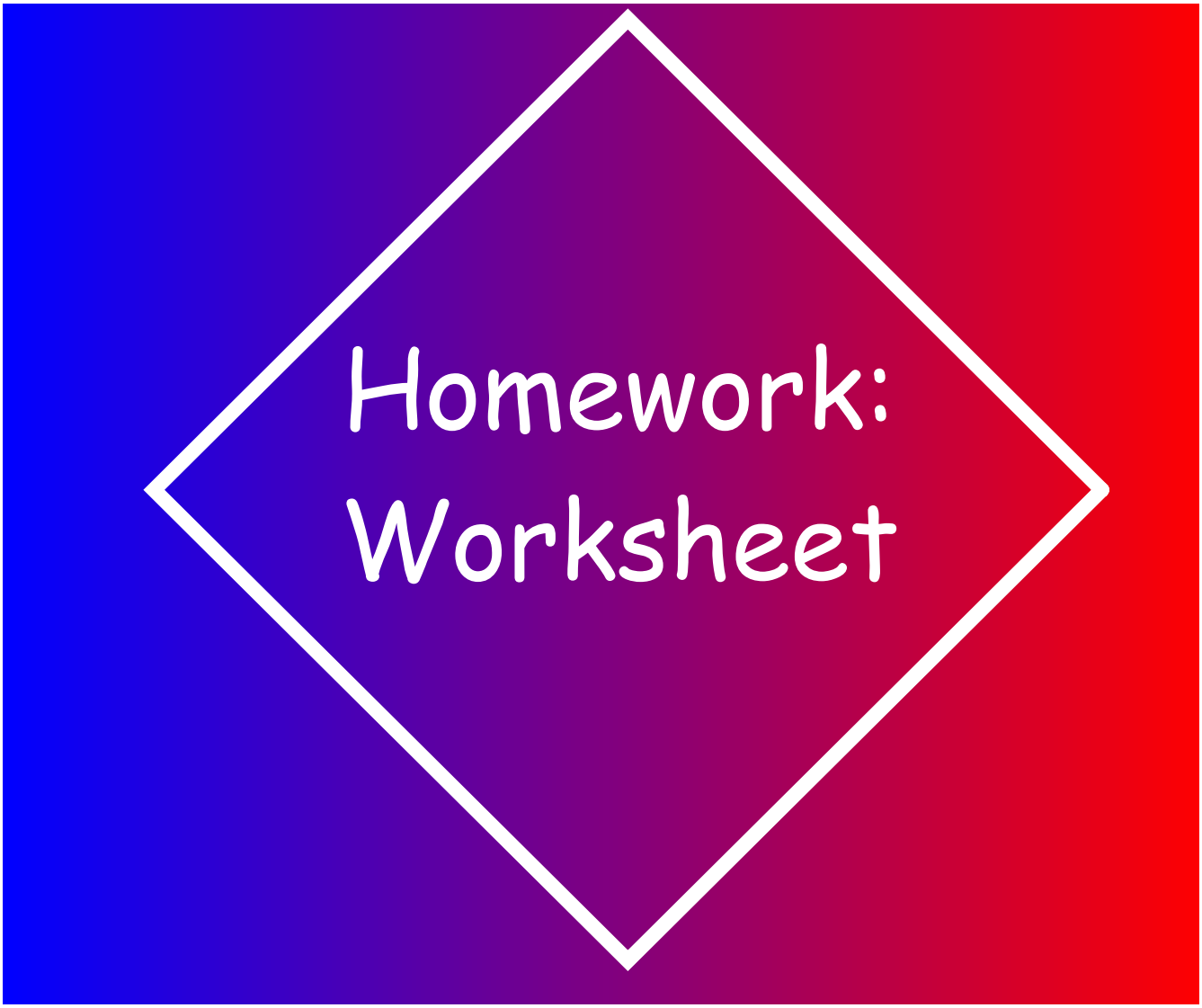
2) $f(x) = \frac{2}{x^2 + 3x}$

$x^2 + 3x \neq 0$

$x(x+3) \neq 0$

$x \neq 0, x \neq -3$

D: $\{x \mid x \neq 0, -3\}$

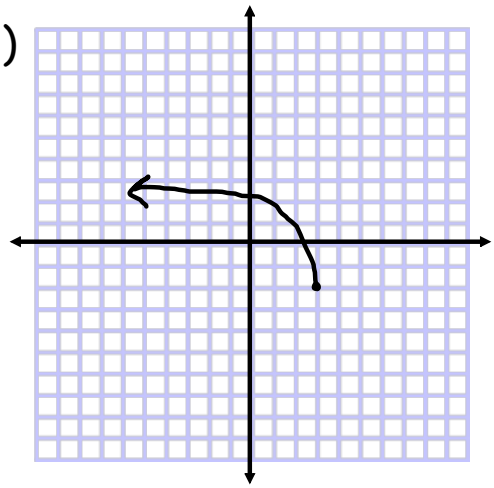

Homework:
Worksheet

Algebra 2
4.4 Domain & Range

Name: _____ Date: _____ Hr: __

Find the domain and range given a graph. Put answers in Set Builder Notation.

1)



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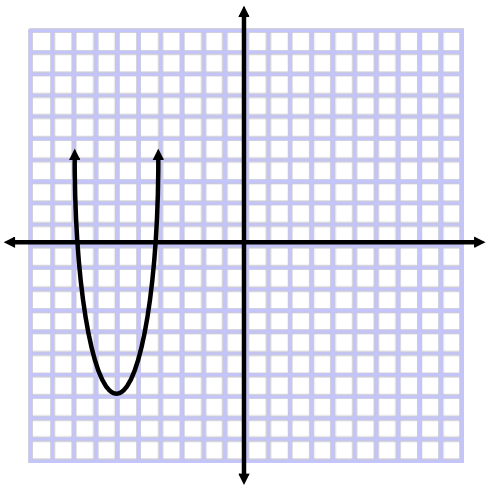
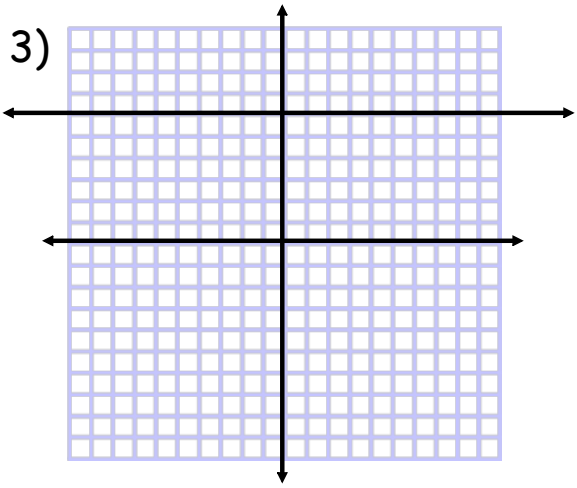


3)



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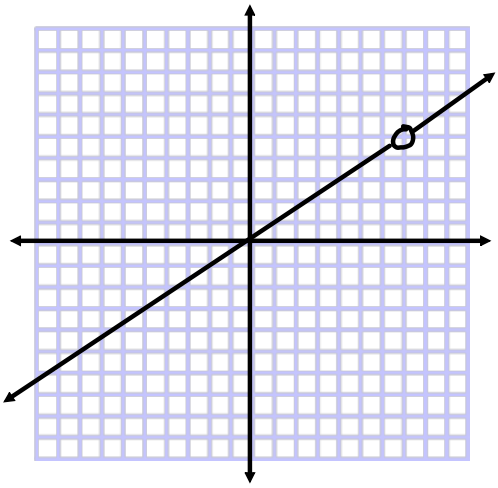
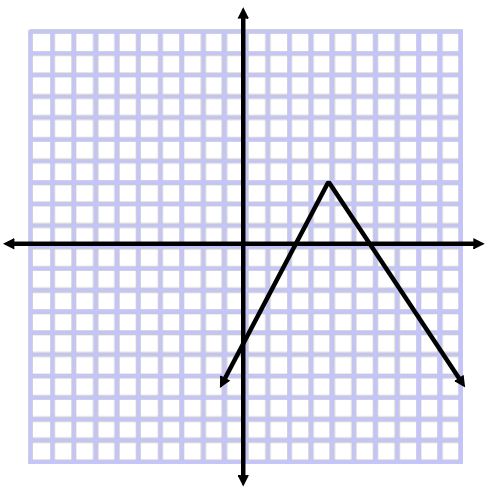
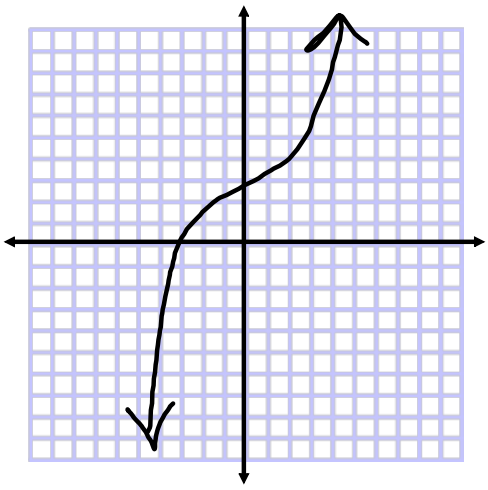


5)



6)



Find the domain and range given a function. Put answers in Set Builder Notation.

7) $3x+4y=-8$

8) $y=6+\sqrt{2x}$

9) $f(x)=\dfrac{3x}{(x+1)(x-3)}$

10) $f(x)=\dfrac{-1}{4x^2-16}$

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

12) $f(x)=2x^2-14x+3$

13) $x=-2$

14) $y=6$

15) $y=\sqrt{6x-7}+4$

16) $f(x)=\dfrac{x^2-4}{x-2}$