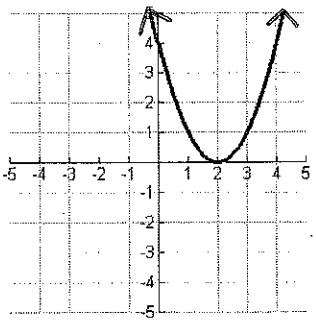
Domain and Range Worksheet Secondary II NAME Key HOUR

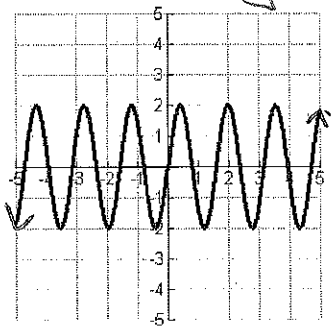
Find the domain and range for each graph then determine if the graph is a function

1. D: $\mathbb{R}$
R: $[0,\infty)$



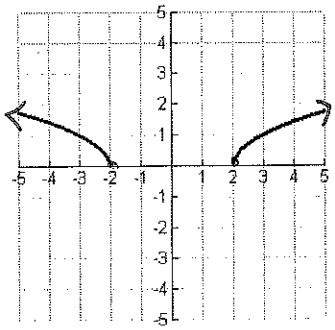
Yes

2. D: $\mathbb{R}$
R: $[-2,2]$



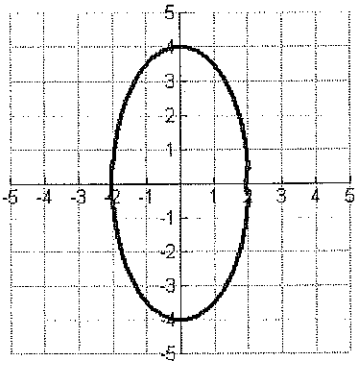
Yes

3. D: $(-\infty,2] \cup [2,\infty)$
R: $[0,\infty)$



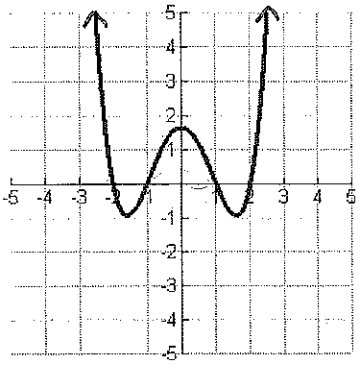
Yes

4. D: $[-2,2]$
R: $[-4,4]$



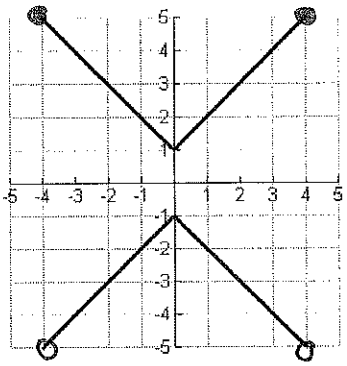
No

5. D: $\mathbb{R}$
R: $[-1,\infty)$



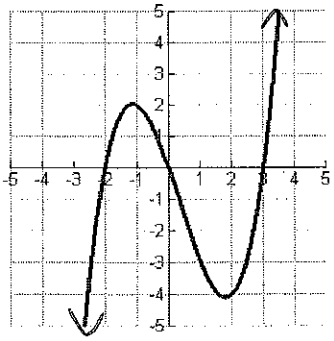
Yes

6. D: $[-4,4]$
R: $(-5,-1] \cup [1,5]$



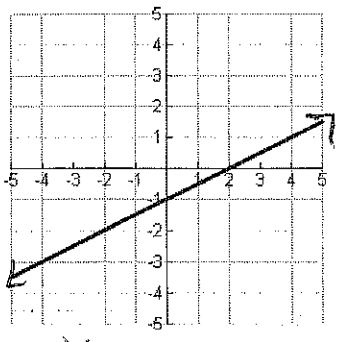
No

7. D: $\mathbb{R}$
R: $\mathbb{R}$



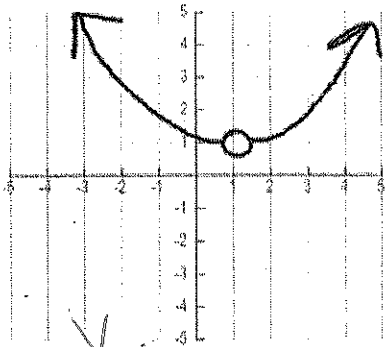
Yes

8. D: $\mathbb{R}$
R: $\mathbb{R}$



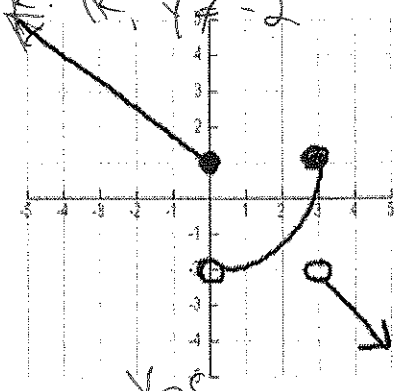
Yes

9. D: $\mathbb{R}, x \neq 1$
R: $(1,\infty)$



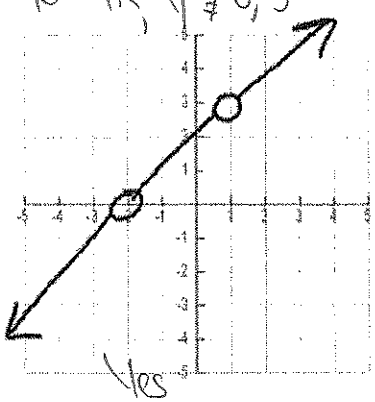
Yes

10. D: $(-\infty, \infty)$ R
R: R, $y \neq -2$



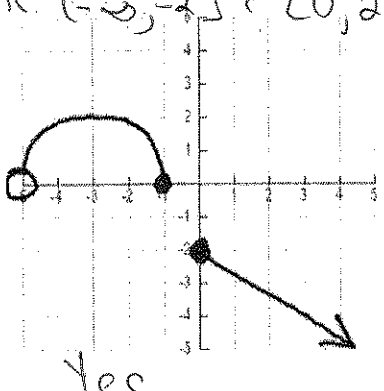
Yes

11. D: R, $x \neq -2, 1$
R: R, $y \neq 0, 3$



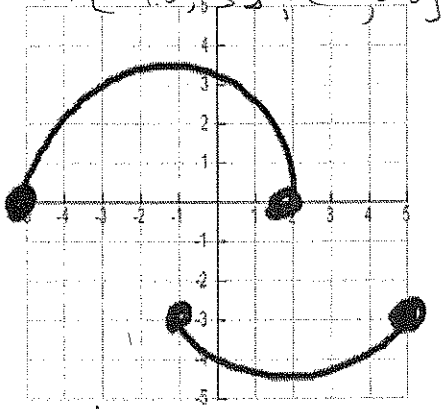
Yes

12. D: $(-5, -1] \cup [0, \infty)$
R: $(-\infty, -2] \cup [0, 2]$



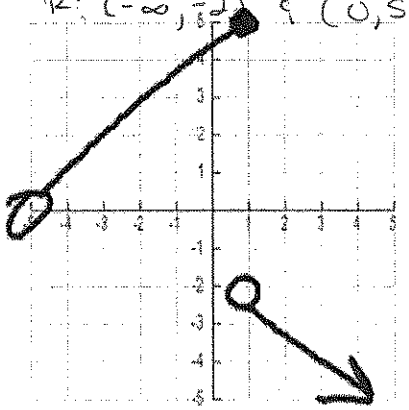
Yes

13. D: $[-5, 5]$
R: $[-4.5, -3] \cup [0, 3.5]$



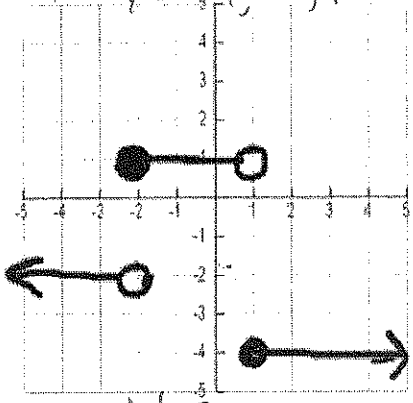
No

14. D: $(-5, \infty)$
R: $(-\infty, -2) \cup (0, 5]$



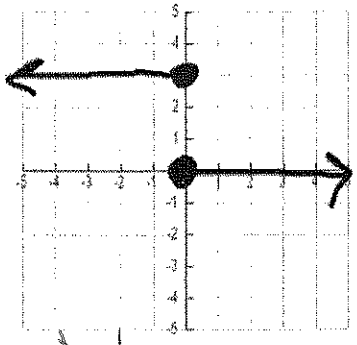
Yes

15. D: $(-\infty, \infty)$ R
R: $y = -4, -2, 1$



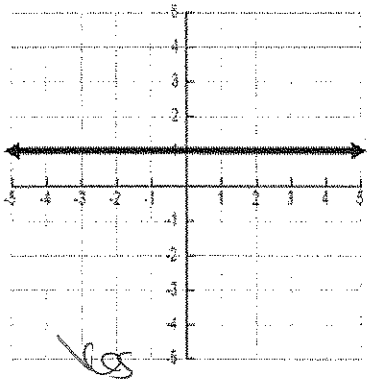
Yes

16. D: R
R: $y = 0, 3$



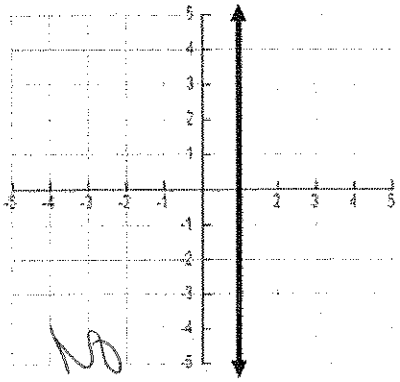
No

17. D: R
R: $y = 1$



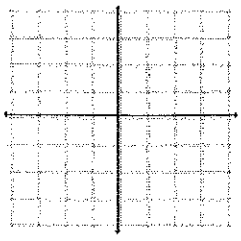
Yes

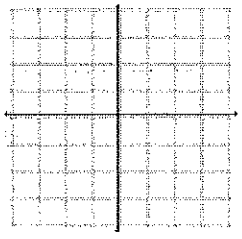
18. D: $x = 1$
R: R

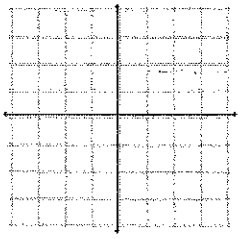


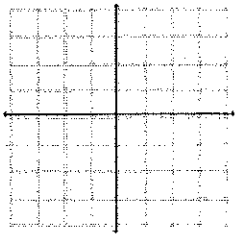
No

19. Draw two functions and two non functions on the graphs below and determine their domains and ranges.









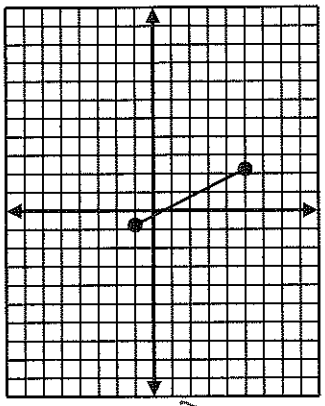
Domain and Range Homework

Name _____

Date Due 10/15/09 Period _____

For each problem: a) State the domain
b) State the range
c) Determine if the graph is a function

1.

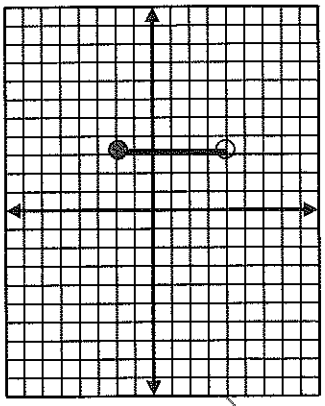


a) [-1, 5]

b) [-1, 2]

c) Yes

2.

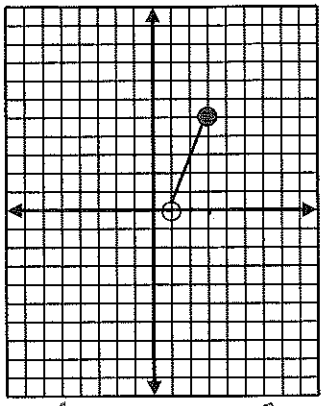


a) [-2, 4)

b) Y=3

c) Yes

3.

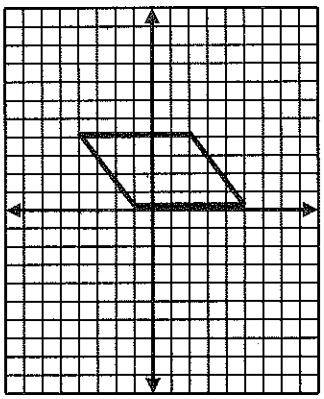


a) (1, 3]

b) (0, 5]

c) Yes

4.

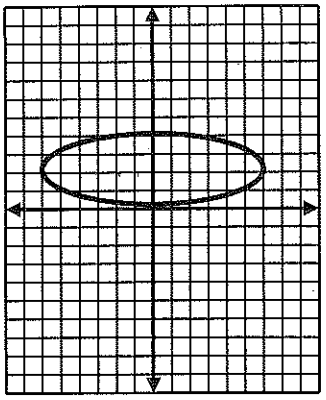


a) [-4, 5]

b) [0, 4]

c) No

5.

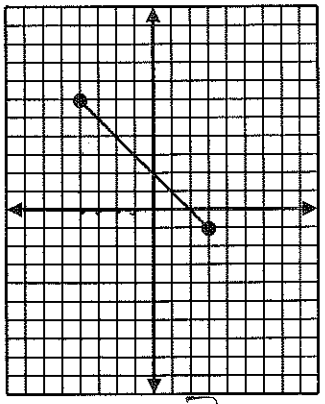


a) [-6, 6]

b) [0, 4]

c) No

6.

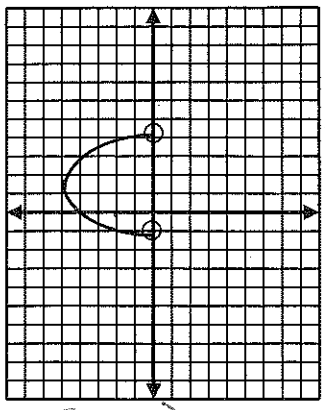


a) [-4, 3]

b) [-1, 6]

c) Yes

7.

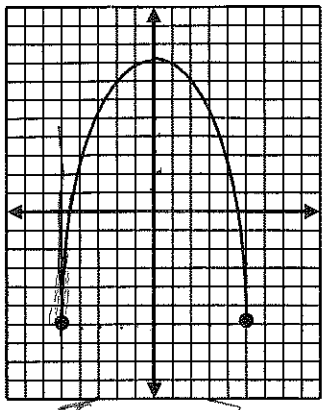


a) $[-5, 0)$

b) $(-1, 4)$

c) No

8.

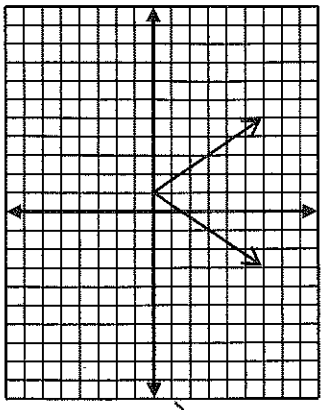


a) $[-5, 5]$

b) $[-6, 8]$

c) Yes

9.

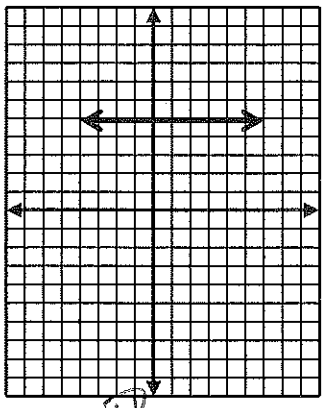


a) $[0, \infty)$

b) $\mathbb{R}$

c) No

10.

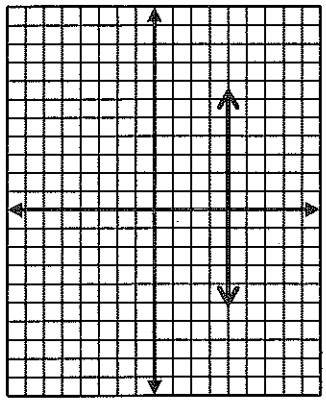


a) $\mathbb{R}$

b) $y = 5$

c) Yes

11.

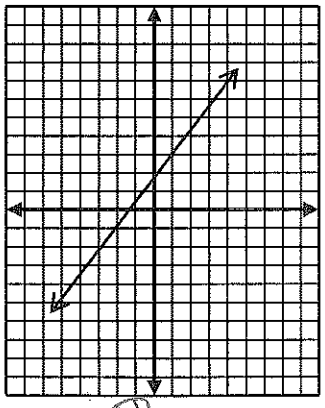


a) $x = 4$

b) $\mathbb{R}$

c) No

12.



a) $\mathbb{R}$

b) $\mathbb{R}$

c) Yes

13. Tara's car travels about 25 miles on one gallon of gas. She has between 10 and 12 gallons of gas in the tank.

a) List the independent and dependent quantities.

gallons (independent) — miles (dependent)

b) Find the reasonable domain and range values.

$10 - 12$

$250 - 300$

c) Write the reasonable domain and range as inequalities.

$10 \le x \le 12$

$250 \le y \le 300$

14. Sal and three friends plan to bowl one or two games each. Each game costs $2.50.

a) List the independent and dependent quantities.

games (independent) — $ (dependent)

b) Find the reasonable domain and range values.

$4 - 8$

$10 - 20$

c) Write the reasonable domain and range as inequalities.

$4 \le x \le 8$

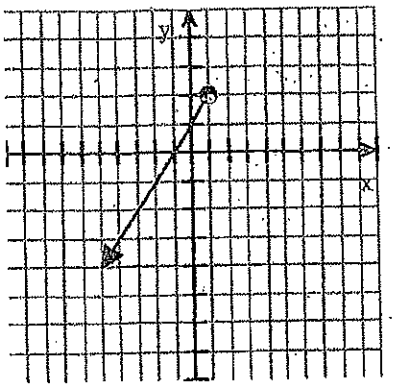
$10 \le y \le 20$

Key

Domain and Range Worksheet #7

For each of the following, determine if the graph represents a function, the domain, and the range.

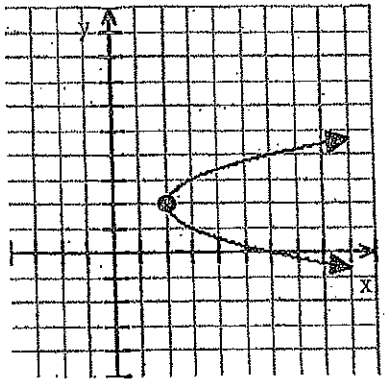
1)



Function? Yes Domain: $(-\infty, 1)$

Range: $(-\infty, 2)$

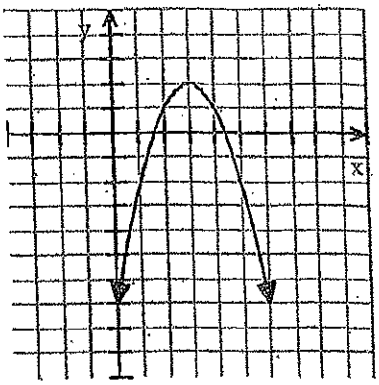
2)



Function? No Domain: $[2, \infty)$

Range: $\mathbb{R}$

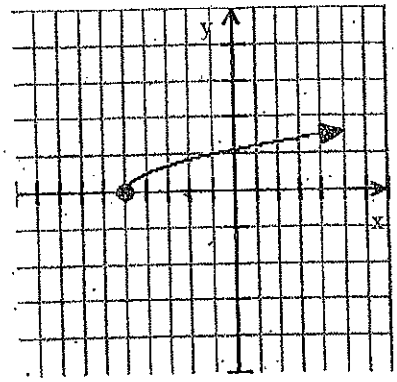
3)



Function? Yes. Domain: $(-\infty, \infty)$, $\mathbb{R}$

Range: $(-\infty, 2]$

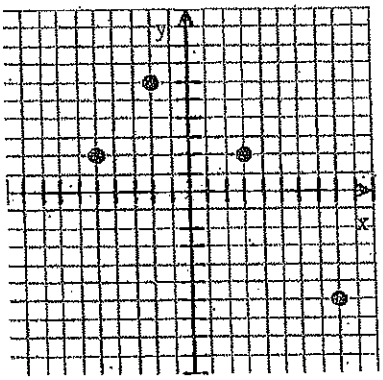
4)



Function? Yes Domain: $[-5, \infty)$

Range: $[0, \infty)$

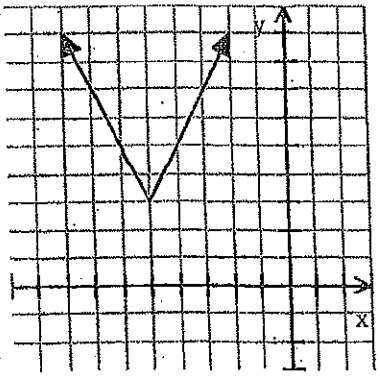
5)



Function? Yes Domain: $x = -5, -2, 3, 8$

Range: $2, 6, -6$

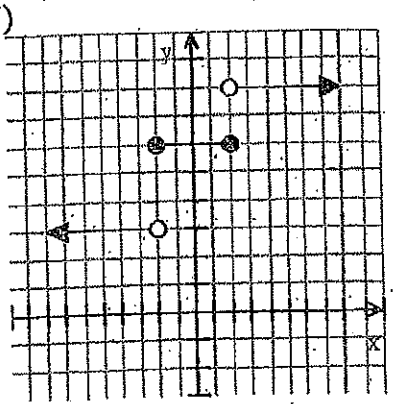
6)



Function? Yes Domain: $\mathbb{R}$

Range: $[3, \infty)$

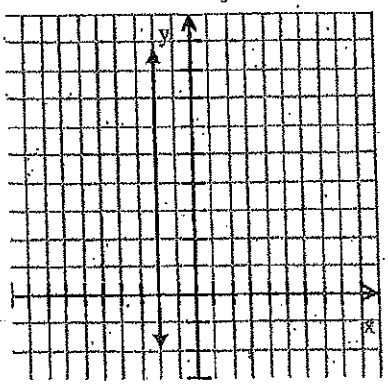
7)



Function? Yes Domain: $\mathbb{R}$

Range: $[3, 8]$

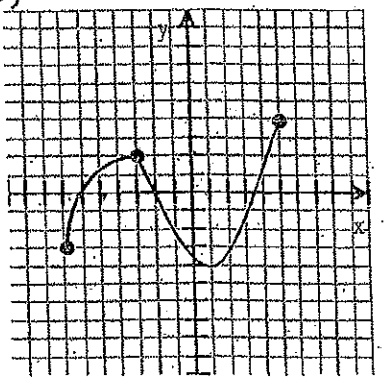
8)



Function? No Domain: $x = -2$

Range: $\mathbb{R}$

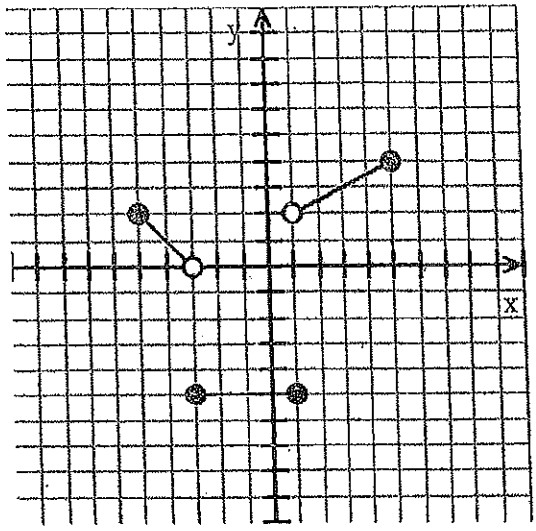
9)



Function? Yes Domain: $[-7, 5]$

Range: $[-4, 4]$

10) Given the graph, find the following:



a) f(0) -5

b) f(1) -5

c) f(-5) 2

d) f(3) 3

e) f(-3) -5

f) f(5) 4

g) f(-2) -5

h) f(6) DNE

11) Suppose $f(x) = 4x - 10$, $g(x) = 2x^2 - 7$, $h(x) = 3 - 5x$. Evaluate each of the following:

a) f(2) -2

b) g(2) 1

c) h(2) -7

d) f(-2) -18

e) g(-2) 1

f) h(-2) 13

g) f(0) -10

h) g(6) 65

Domain and Range Practice from Functions

1. $d(y) = y + 3$
2. $g(k) = 2k^2 + 4k - 6$
3. $b(n) = \sqrt{2n - 8}$
4. $m(t) = \sqrt{9 - 3t}$
5. $u(x) = \dfrac{(x-5)}{(2x+4)}$
6. $a(r) = r + \dfrac{1}{(r-1)}$
7. $y(c) = \dfrac{2}{(c^2 + 3c)}$
8. $q(w) = \dfrac{(w+4)}{(w^2+1)}$
9. $f(x) = \dfrac{x}{6}$
10. $t(v) = \sqrt{v^2 + 2v - 8}$
11. $n(t) = \sqrt{1+x}$
12. $x(y) = y^4 + 2y - 6$

	Domain	Range	Function? Yes or No?
1.	$\mathbb{R}$	$\mathbb{R}$	Yes
2.	$\mathbb{R}$	$[-8, \infty)$	Yes
3.	$[4, \infty)$	$[0, \infty)$	Yes
4.	$(-\infty, 3]$	$[0, \infty)$	Yes
5.	$\mathbb{R}, x \neq -2$	$\mathbb{R}, y \neq \frac{1}{2}$	Yes
6.	$\mathbb{R}, x \neq 1$	$(-\infty, -1] \cup [3, \infty)$	Yes
7.	$\mathbb{R}$ $x \neq -3, 0$	$\mathbb{R}, y \neq 0$	Yes
8.	$\mathbb{R}$	$[0, -1]$	Yes
9.	$\mathbb{R}$	$\mathbb{R}$	Yes
10.	$(-\infty, -4] \cup [2, \infty)$	$[0, \infty)$	Yes
11.	$[-1, \infty)$	$[0, \infty)$	Yes
12.	$\mathbb{R}$	$[-7.2, \infty)$	Yes

Domain & Range from Algebraic Equations

Consider the following functions.

- Decide if there are any values of x that are not allowed therefore creating a restricted domain. State the domain of each function in set notation and why it is restricted.
- Then consider if this restricted domain results in a restricted range. State the range of each function in set notation and why it is restricted.

Function	Domain *and* Why Restricted	Range *and* Why Restricted
(13) $f(x)=3x+1$	$\{x : x \in Reals\}$ *no restrictions*	$\{y : y \in Reals\}$ *no restrictions*
(14) $f(x)=\frac{1}{x}$	$\{x : x \neq 0\}$ *Division by zero is undefined.*	$\{y : y \neq 0\}$ *Because the numerator is a constant, y will never result in the value 0.*
(15) $g(x)=\sqrt{x}$	$\{x : x \geq 0\}$ *You cannot take a square root of a negative number*	$\{y : y \geq 0\}$, *A radical is always the principal square root therefore always positive or zero.*
(16) $f(x)=\frac{1}{2x-6}$	$\{x : x \neq 3\}$ *Division by zero is undefined*	$\{y : y \neq 0\}$ *Because the numerator is a constant, y will never result in the value 0.*
(17) $g(x)=-\sqrt{x-2}$	$\{x : x \geq 2\}$, *You cannot take a square root of a negative number.*	$\{y : y \leq 0\}$, *A radical is always the principal square root therefore always positive or zero. The negative in front of the radical makes it always negative or zero*

(18) Explain two types of domain restrictions in the real number system demonstrated by the examples above:

I. *Division by zero is undefined.*

II. *The value under the square root (or any even root) must be > 0.*

Combinations of Functions When a third function is created from the combination of two functions, the domain of the combination must include the domains of the original functions further restricted by the new combination function.

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

$g(x)=\frac{1}{x-3}$ What is the domain of $g(x)$? $x \neq 3$

Find the equation for the following combinations and determine the new domain in set notation:

(19) $(f+g)(x) = (f+g)(x)=\sqrt{x-2}+\frac{1}{x-3}$ Domain: $\{x \geq 2,\ x \neq 3\}$

(20) $(fg)(x) = (fg)(x)=\frac{\sqrt{x-2}}{x-3}$ Domain: $\{x \geq 2,\ x \neq 3\}$

(21) $\frac{g}{f}(x) = \frac{g}{f}(x)=\frac{1}{(x-3)\sqrt{x-2}}$ Domain: $\{x > 2,\ x \neq 3\}$