

## Domain &amp; Range of Functions - NOTES

State the Domain &amp; Range of each function.

1)  $g(n) = \frac{5n+10}{4}$

DOMAIN: ALL REAL NUMBERS

RANGE: FIND THE INVERSE.

$$x = \frac{5y+10}{4}$$

$$4x = 5y+10$$

$$4x-10 = 5y$$

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

RANGE OF ORIGINAL = DOMAIN OF INVERSE.

ALL REAL NUMBERS

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

DOMAIN:  $x \neq 1$

RANGE:  $y \neq -2$

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

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

$$(-y+1)(x+2) = -2$$

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

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

$$y = \frac{2}{x+2} + 1 \rightarrow x \neq -2$$

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

DOMAIN:  $x \neq 2$

RANGE:  $y \neq 2$

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

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

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

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

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

$$\downarrow$$

$$x \neq 2$$

4)  $g(x) = \frac{3}{x-3} - 2$

DOMAIN:  $x \neq 3$

RANGE:  $y \neq -2$

$$x = \frac{3}{y-3} - 2$$

$$x+2 = \frac{3}{y-3}$$

$$(y-3)(x+2) = 3$$

$$y-3 = \frac{3}{x+2}$$

$$y = \frac{3}{x+2} + 3$$

$$\downarrow$$

$$x \neq -2$$

$$5) f(x) = 3 + 2x^3$$

DOMAIN: ALL REAL NUMBERS

RANGE:

$$x = 3 + 2y^3$$

$$x - 3 = 2y^3$$

$$\frac{x-3}{2} = y^3$$

$$\sqrt[3]{\frac{x-3}{2}} = y$$

$$*6) g(x) = \sqrt{x} - 1$$

DOMAIN:  $x \geq 0$

RANGE: ALL REAL NUMBERS

$$x = \sqrt{y} - 1$$

$$x + 1 = \sqrt{y}$$

$$(x+1)^2 = y$$

$$*7) f(x) = \sqrt{\frac{x+3}{2}}$$

DOMAIN:  $x \geq -3$

RANGE: ALL REAL NUMBERS

$$x = \sqrt{\frac{y+3}{2}}$$

$$x^2 = \frac{y+3}{2}$$

$$2x^2 = y+3$$

$$2x^2 - 3 = y$$

$$8) f(n) = (n+1)^3 + 2$$

DOMAIN: ALL REAL NUMBERS

RANGE: ALL REAL NUMBERS

$$x = (y+1)^3 + 2$$

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

$$\sqrt[3]{x-2} = y+1$$

$$\sqrt[3]{x-2} - 1 = y$$

$$9) f(n) = -2n^3 + 3$$

DOMAIN: ALL REAL NUMBERS

RANGE: ALL REAL NUMBERS

$$x = -2y^3 + 3$$

$$x - 3 = -2y^3$$

$$\frac{x-3}{-2} = y^3$$

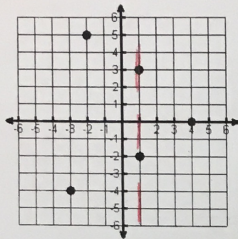
$$\sqrt[3]{\frac{x-3}{-2}} = y$$

Domain and Range Notes

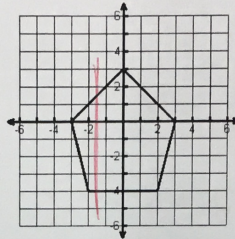
NAME: HEY

State the domain and range for each graph and then tell if the graph is a function (write yes or no).  
If the graph is a function, state whether it is discrete, continuous or neither.

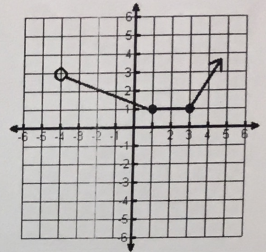
- 1) Domain  $\{-3, -2, 1, 4\}$   
Range  $\{-4, -2, 0, 3, 5\}$   
Function? NO



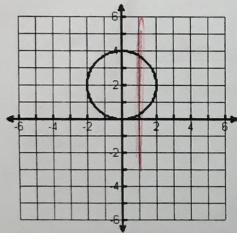
- 2) Domain  $[-3, 3]$   
Range  $[-4, 3]$   
Function? NO



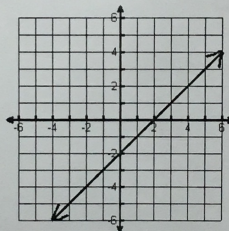
- 3) Domain  $x > -4$   
Range  $y \geq 1$   
Function? YES



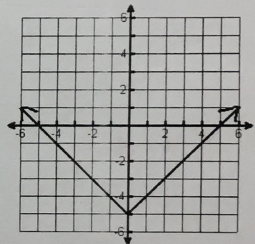
- 4) Domain  $[-2, 2]$   
Range  $[0, 4]$   
Function? NO



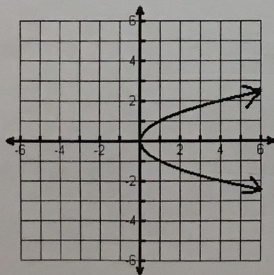
- 5) Domain ALL REALS (IR)  
Range ALL REALS  
Function? YES



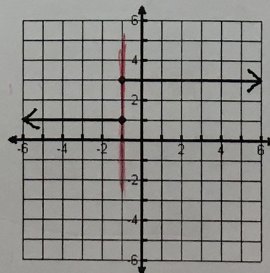
- 6) Domain ALL REALS  
Range  $y \geq -5$   
Function? YES



- 7) Domain  $x \geq 0$   
Range ALL REALS  
Function? NO



- 8) Domain ALL REALS  
Range  $\{1, 3\}$   
Function? NO



- 9) Domain  $x < -3, -3 \leq x < 2$   
Range  $y > -2$   
Function? YES

