12. $-7x - 3x + 2 < -8x - 8$

$-10x + 2 < -8x - 8$

$+8x \qquad\qquad +8x$

$-2x + 2 < -8$

$\quad -2 \qquad -2$

$\frac{-2x}{-2} < \frac{-10}{-2}$

÷ by negative!

$x > 5$

14.) $8x - 12 \leq -2x + 2 + 10x$

$\cancel{8x} - 12 \leq \cancel{8x} + 2$

$-12 \leq 2$

true

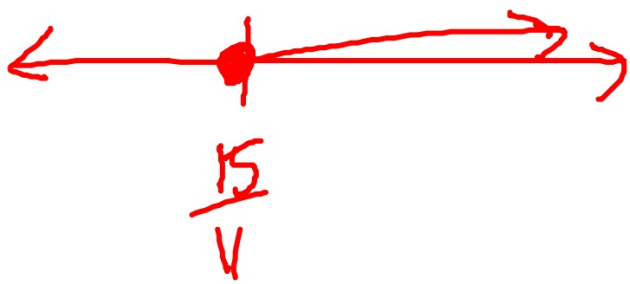
All reals

$$13.3\left(4x - \frac{x}{3} \geq 5\right)$$

$$12x - x \geq 15$$

$$11x \geq 15$$

$$x \geq \frac{15}{11}$$



15) $-8x + 20x + 4 < -6x - 14$

$12x + 4 < -6x - 14$

$18x + 4 < -14$

$\quad -4 \quad -4$

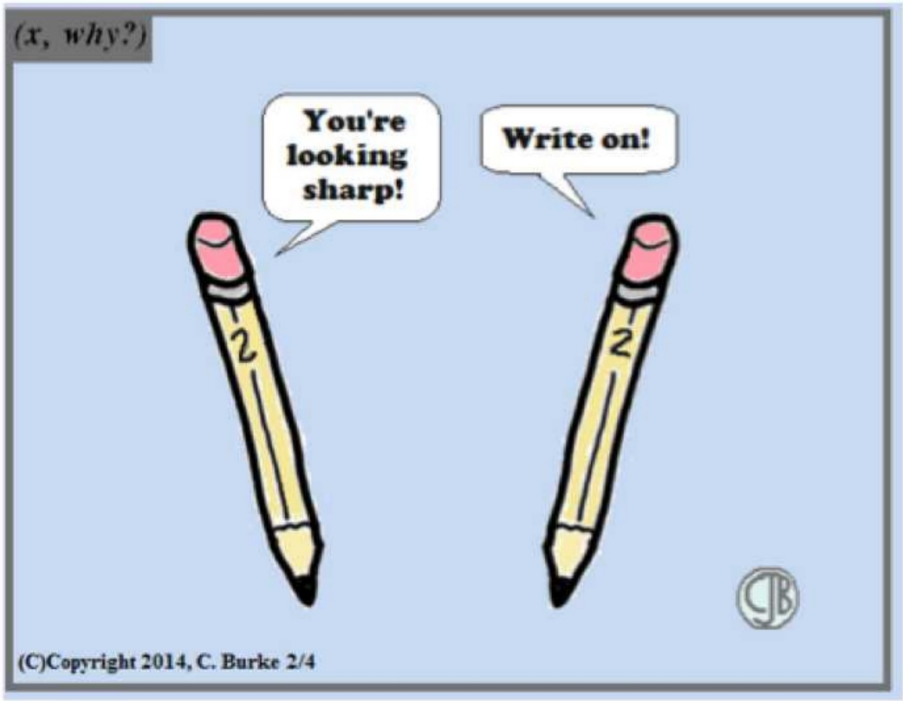
$18x < -18$

$x < -1$

$2+m$	negative
$5+m$	positive

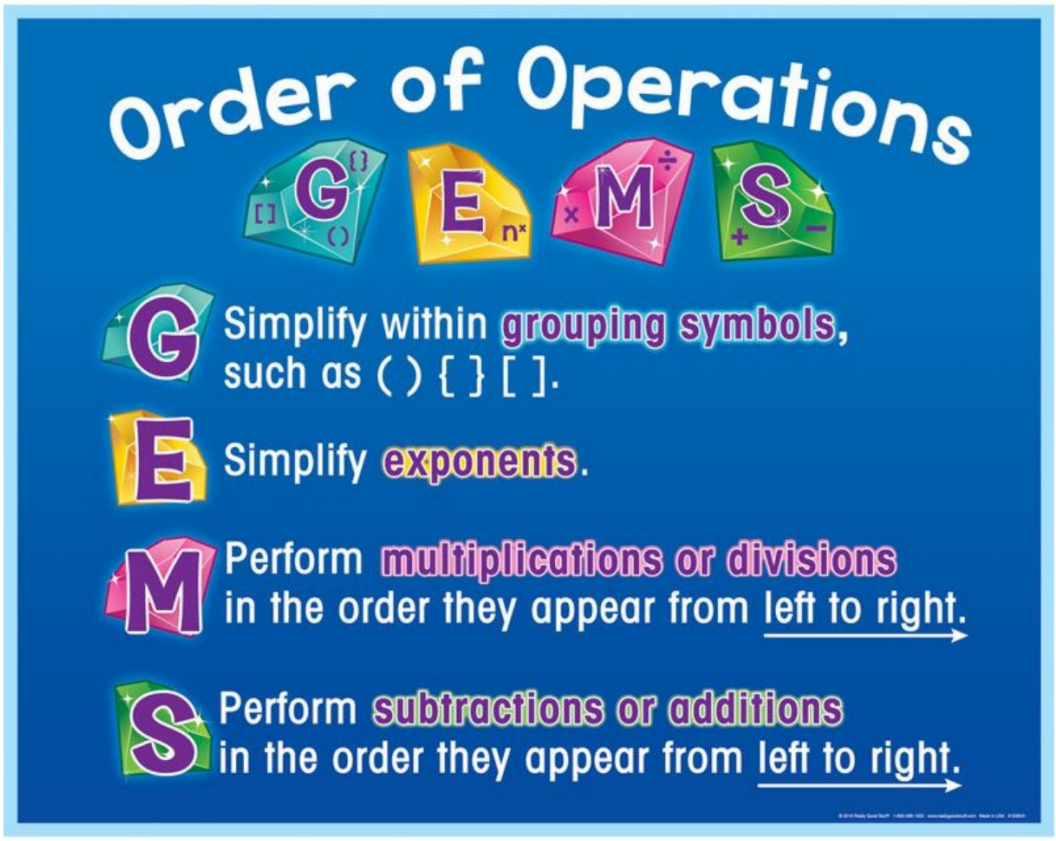
C

Domain and Range *and Order of Operations*



*See printout.

Order of Operations



Simplify.

1) $8 \div 4 \cdot 2$

$2 \cdot 2$

4

2) $(-6 \div 6)^3$

$(-1)^3$

-1

Simplify.

3) $4-2|3^2-16|$

$4-2|9-16|$

$4-2|-7|$

$4-2\cdot 7$

$4-14$

-10

4) $5(-5+6)\cdot 6^2$

$5(1)\cdot 6^2$

$5\cdot 1\cdot 36$

180

Simplify.

5) $-4-[2+4(-6)-4-|2^2-5\cdot 2|]$

$4-5\cdot 2$

$-4-[2+4(-6)-4-|-6|]$

$-4-[2-24-4-6]$

$-4-[-32]$

$-4+32$

28

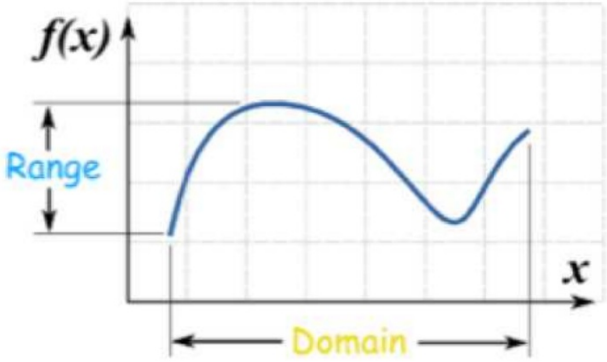
6) $\dfrac{-9\cdot 2-(3-6)}{1-(-2+1)-(-3)}$

$\dfrac{-9\cdot 2-(-3)}{1-(-1)-(-3)}$

$\dfrac{-18-(-3)}{1-(-1)-(-3)}$

$\dfrac{-18+3}{1+1+3}=\dfrac{-15}{5}$

-3



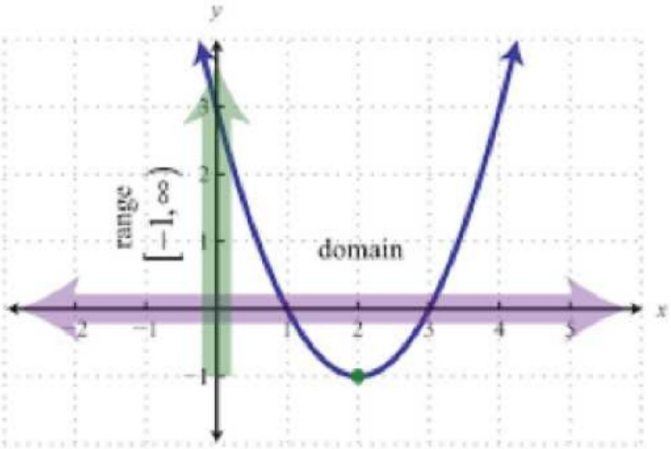
domain -

x-values

range - y-values

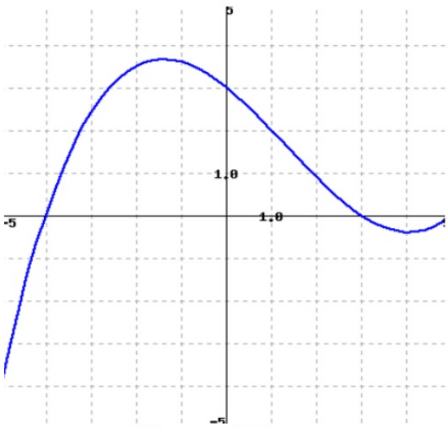
Questions to consider before finding domain and range...

- Does the graph open "left/right" forever?
- Does the open "up/down" forever?
- Can you trace the graph without lifting your pencil?

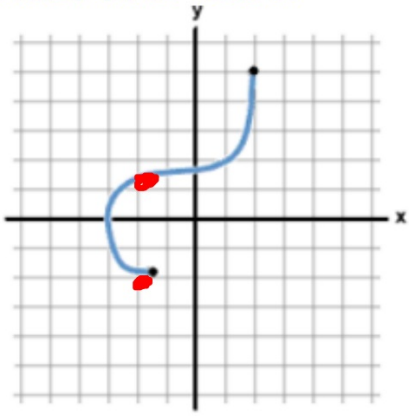


Definition of a function: A function from a set D to a set R is a rule that assigns to every element in D a unique element in R. The set D of all input values is the doain of the function and the set R of output values is the range of the function.

A function must pass the vertical line test:



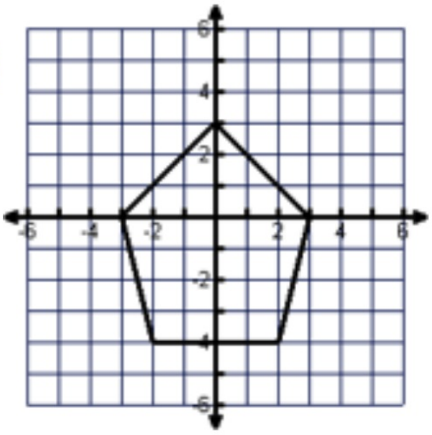
Function



Not a function

Is the graph a function? State yes or no.
State the domain in both notations.

1)



Function? no

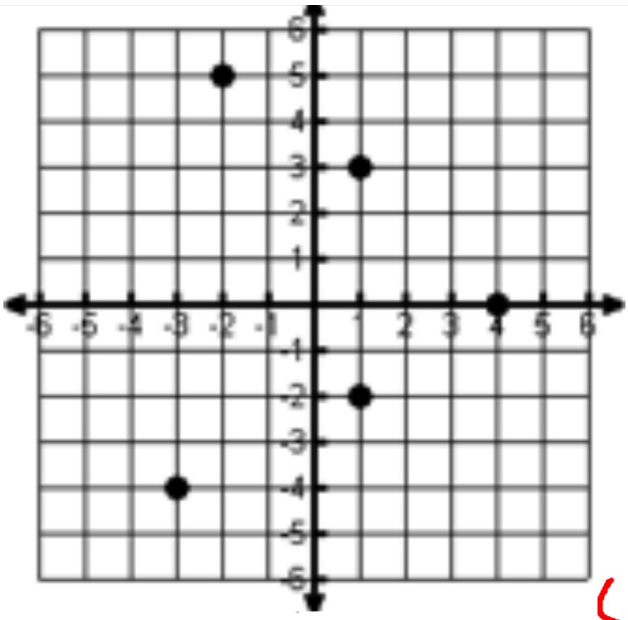
Set notation: Domain $\{x \mid -3 \le x \le 3\}$

Range $\{y \mid -4 \le y \le 3\}$

Interval notation: Domain $[-3, 3]$

Range $[-4, 3]$

2)



Function? NO

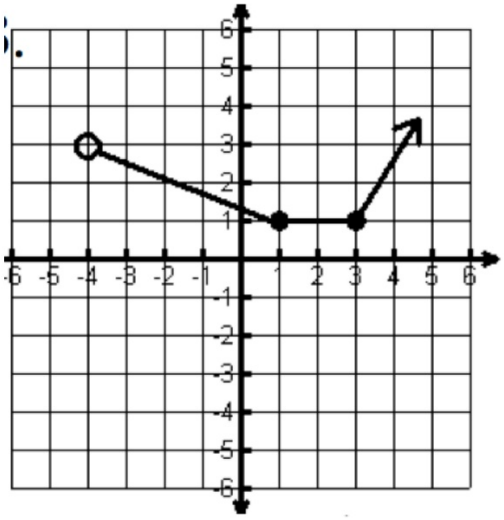
Set notation: Domain $\{-3, -2, 1\}$

Range $\{-4, -2, 3, 5\}$

Interval notation: Domain $[-3] \cup [-2] \cup [1]$

Range $[-4] \cup [-2] \cup [3] \cup [5]$

3)



Function? yes

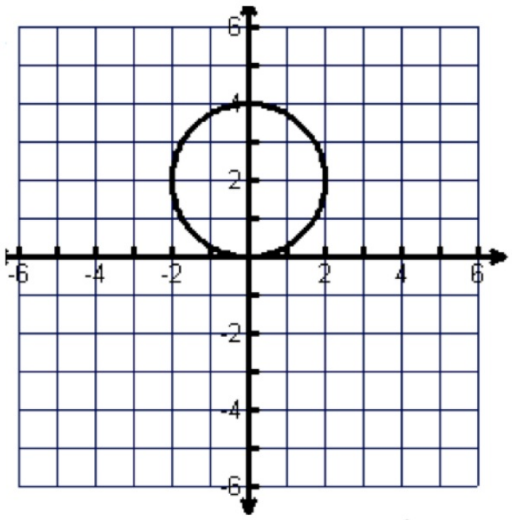
Set notation: Domain $\{x \mid x > -4\}$

Range $\{y \mid y \geq 1\}$

Interval notation: Domain $(-4, \infty)$

Range $[1, \infty)$

4)



Function?_____

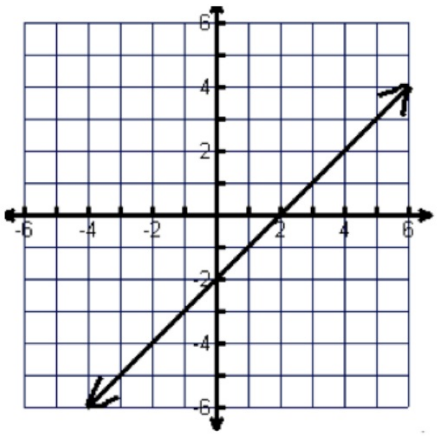
Set notation: Domain_____

Range_____

Interval notation: Domain_____

Range_____

5)



Function? yes

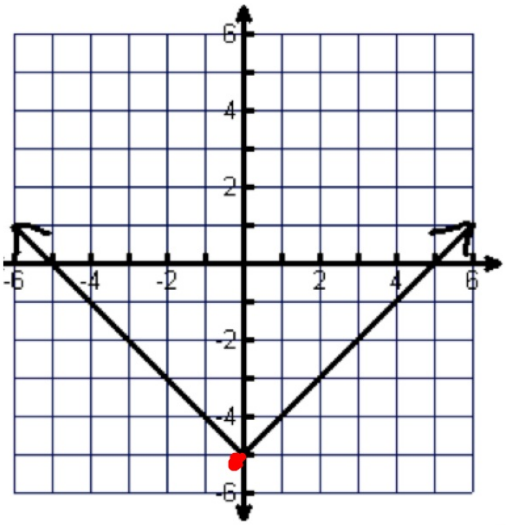
Set notation: Domain $\{x \mid x \in R\}$

Range $\{y \mid y \in R\}$

Interval notation: Domain $(-\infty, \infty)$

Range $(-\infty, \infty)$

6)



Function? Yes

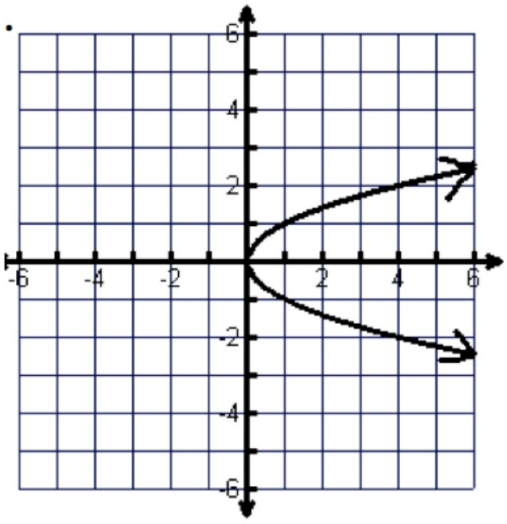
Set notation: Domain $\{x \mid x \in R\}$

Range $\{y \mid y \geq -5\}$

Interval notation: Domain $(-\infty, \infty)$

Range $[-5, \infty)$

7)



Function? NO

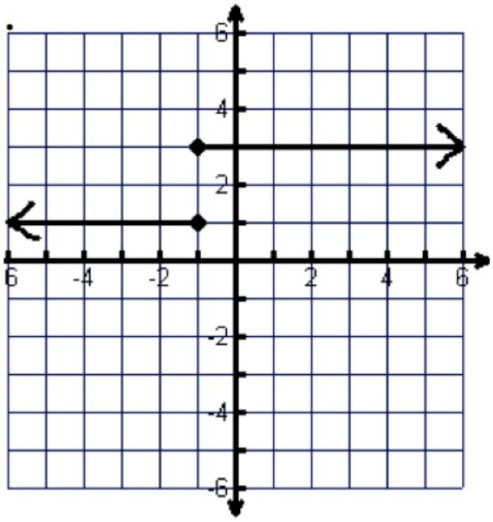
Set notation: Domain $\{x \mid x \geq 0\}$

Range $\{y \mid y \in R\}$

Interval notation: Domain $[0, \infty)$

Range $(-\infty, \infty)$

8)



Function?_____

Set notation: Domain_____

Range_____

Interval notation: Domain_____

Range_____