

# Domain & Range

Thursday, April 18, 2019 8:40 AM

Domain: set of all possible input values of a relation (i.e. all possible  $x$  values.) \* independent variable.

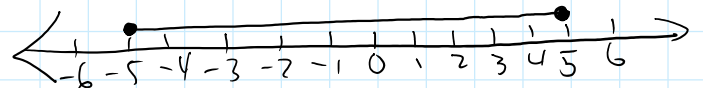
Range: set of all possible output values of a relation (i.e.  $y$  values or dependant variable.)

We can describe these in a number of ways:

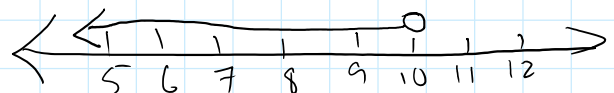
① Words: eg The domain is all real numbers between -5 and 5 inclusive.  
eg The range is all real numbers less than ten.

② Number line:

Domain of above:

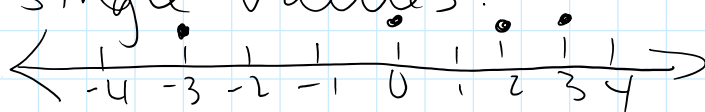


Range of above



• includes the point    o doesn't include the point

Sometimes the domain &/or range are just single values.



③ List: can be only be used for discrete data  
eg Relation:  $(2, 3)$   $(-1, 5)$   $(-4, 7)$   $(-7, 9)$

eg Relation:  $(2, 3)$   $(-1, 5)$   $(-4, 7)$   $(-7, 9)$

Domain:  $\{-7, -4, -1, 2\}$

list values from smallest to largest

Range:  $\{3, 5, 7, 9\}$

#### ④ Set Notation

Domain of real #'s between 5 & -5

$\{x \mid -5 \leq x \leq 5, x \in \mathbb{R}\}$

$x$  such that

always  $<$  or  $\leq$  includes #  
doesn't include #

must have smallest value 1<sup>st</sup>

$x \in \mathbb{R}$  reads as " $x$  is an element of the set of Real numbers"

Range of real #'s less than 10

$\{y \mid y < 10, y \in \mathbb{R}\}$

#### ⑤ Interval Notation: use brackets

[ means the value is included

( means the value is not included.

Domain  $[-5, 5]$

smallest # first

Range  $(-\infty, 10)$

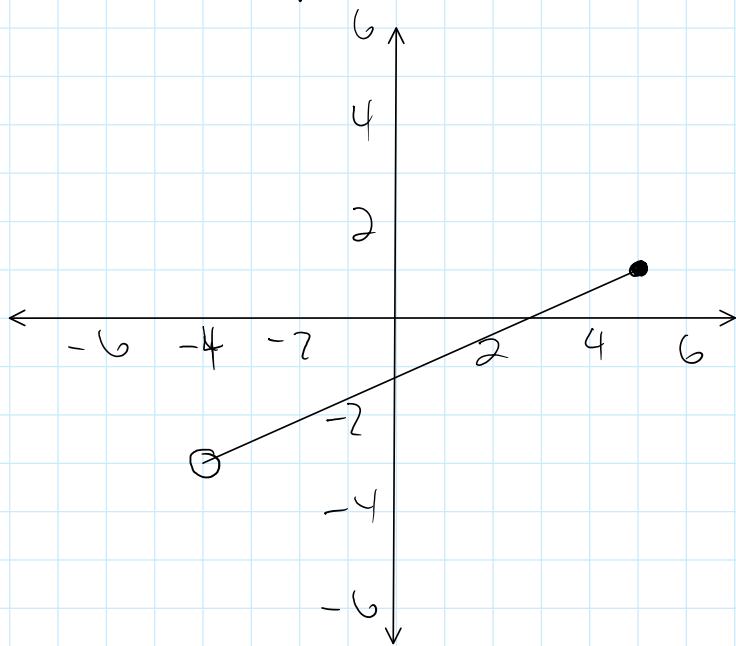
↑  
infinity

always use a  
( for  $\infty$

Examples:

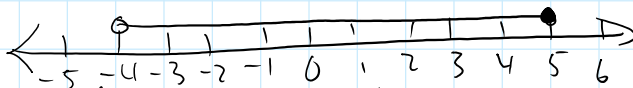
Domain:

# Examples:



Domain:

Number Line



Set Notation

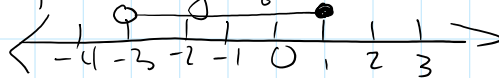
$$\{x \mid -4 < x \leq 5, x \in \mathbb{R}\}$$

< ○ ≤ ●

Interval Notation

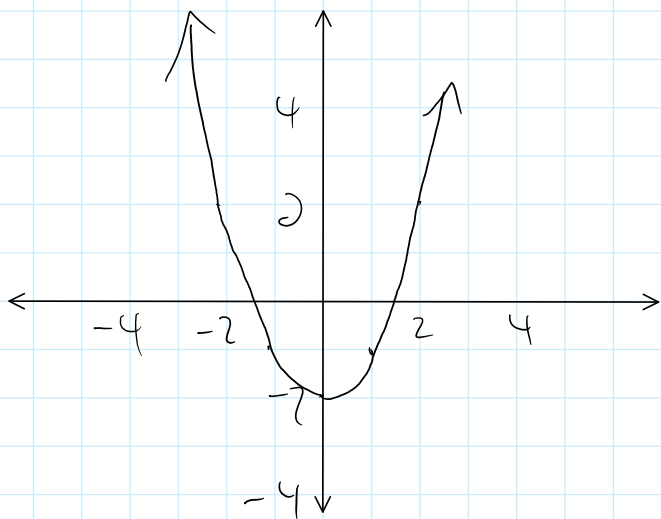
$$(-4, 5]$$

Range:

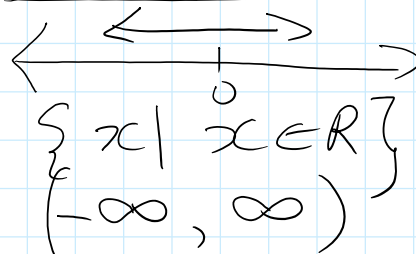


$$\{y \mid -3 < y \leq 1, y \in \mathbb{R}\}$$

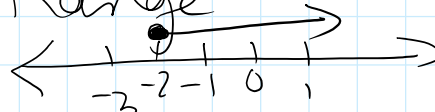
$$(-3, 1]$$



Domain



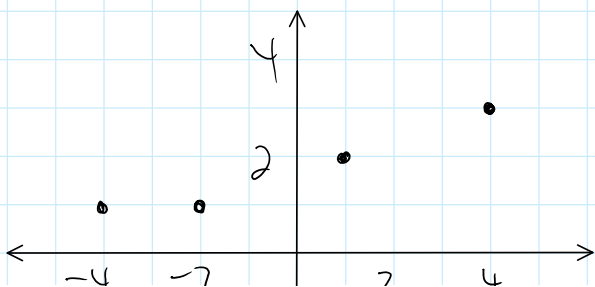
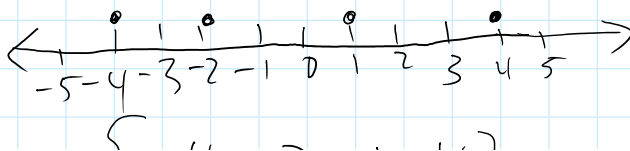
Range

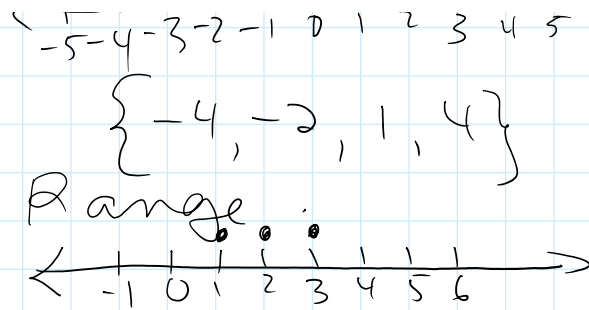
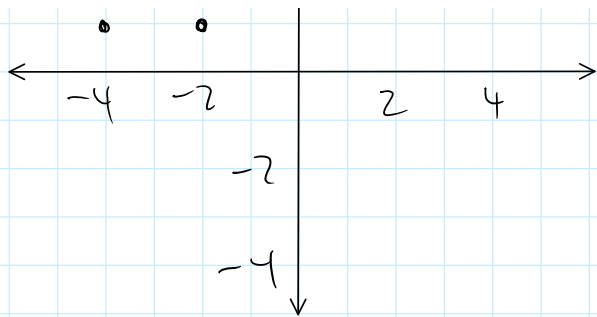


$$\{y \mid y \geq -2, y \in \mathbb{R}\}$$

$$[-2, \infty)$$

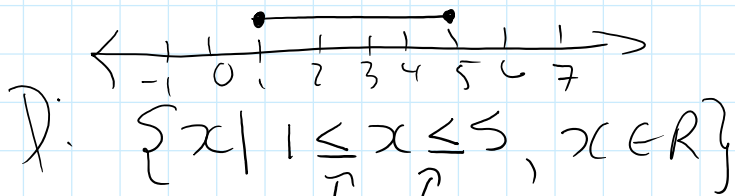
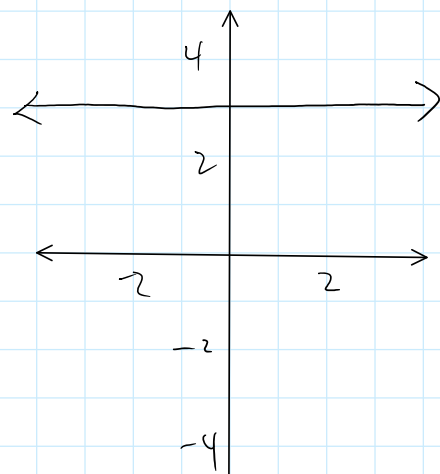
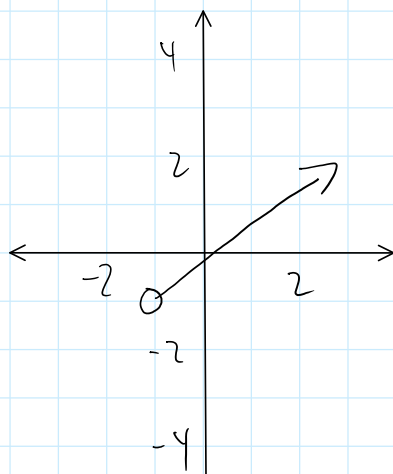
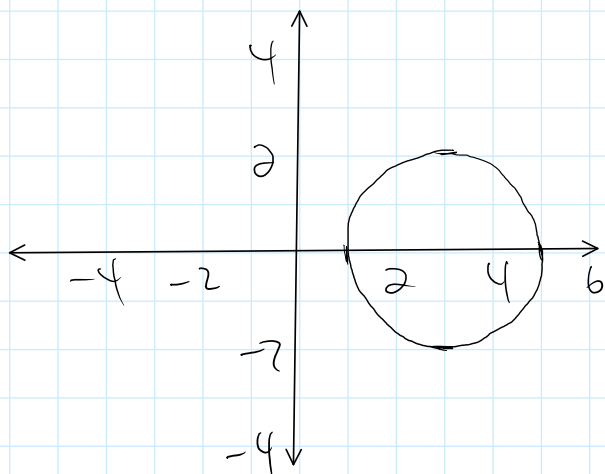
Domain





$$\{1, 2, 3\}$$

Try: Using 2 different notations, state domain & range

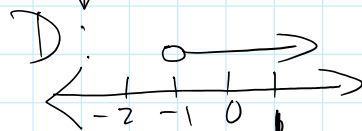


D:  $\{x \mid 1 \leq x \leq 5, x \in \mathbb{R}\}$

$$[1, 5]$$

R:  $\{y \mid -2 \leq y \leq 2, y \in \mathbb{R}\}$

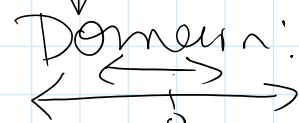
$$[-2, 2]$$



D:  $\{x \mid x > -1, x \in \mathbb{R}\}$

$$(-1, \infty)$$

Range is the same :)



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

$$(-\infty, \infty)$$



Range:  $\{3\}$   
 $\{y \mid y = 3\}$

Pg 301 - 304 # 1-9.