Honors Math II
Interval notation, Domain and Range

Name_____
Period_____Date_____

An **interval** is a connected subset of numbers. **Interval notation** is an alternative to expressing your answer as an inequality. Unless specified otherwise we will be working with real numbers.

Parentheses

Brackets

When using interval notation, the symbol:	
(	means "not included" or "open".
[	means "included" or "closed".

$2 \le x < 6$	as an inequality.
$[2, 6)$	in interval notation.

closed circle in interval notation is "["

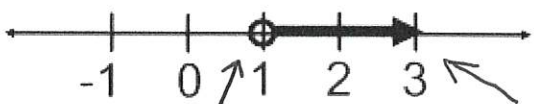
closed circle

closed circle

inequality notation
$0 \le x \le 3$

interval notation $[0, 3]$

open circle in interval notation is "("



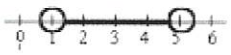
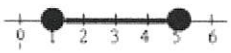
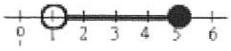
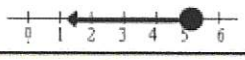
open circle does not include the point

shades to the right towards " ∞ " infinity

inequality notation
$x > 1$

interval notation
$(1, \infty)$

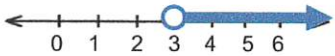
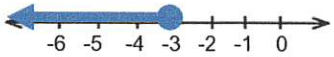
The chart below will show you all of the possible ways of utilizing interval notation.

Interval Notation: (description)	(diagram)
Open Interval: (a, b) is interpreted as $a < x < b$ where the endpoints are NOT included. (While this notation resembles an ordered pair, in this context it refers to the interval upon which you are working.)	$(1, 5)$ 
Closed Interval: $[a, b]$ is interpreted as $a \le x \le b$ where the endpoints are included.	$[1, 5]$ 
Half-Open Interval: $(a, b]$ is interpreted as $a < x \le b$ where a is not included, but b is included.	$(1, 5]$ 
Half-Open Interval: $[a, b)$ is interpreted as $a \le x < b$ where a is included, but b is not included.	$[1, 5)$ 
Non-ending Interval: (a, ∞) is interpreted as $x > a$ where a is not included and infinity is always expressed as being "open" (not included).	$(1, \infty)$ 
Non-ending Interval: $(-\infty, b]$ is interpreted as $x \le b$ where b is included and again, infinity is always expressed as being "open" (not included).	$(-\infty, 5]$ 

* Write interval notation reading your graph from smallest number to biggest number *

More Examples

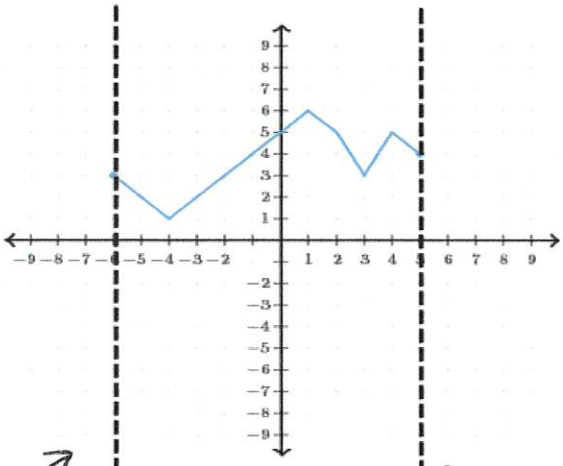
Inequality	Graph	Interval Notation
$-2 < x \le 2$		(-2, 2]
$0 \le x < 21$		[0, 21)
$-6 < x < -3$		(-6, -3)
$2 \le x \le 5$		[2, 5]

Inequality	Graph	Interval Notation
$x > 3$		(3, ∞)
$x \le -3$		(-∞, -3]
$x < 0$		(-∞, 0)
$x \ge -2$		[-2, ∞)

Brackets closed circles

Parentheses open circles

The function $f(x)$ is graphed; what is its domain?



Boundary

Boundary

Domain of this function is more than a finite set of numbers.

This graph is continuous and has infinite points.

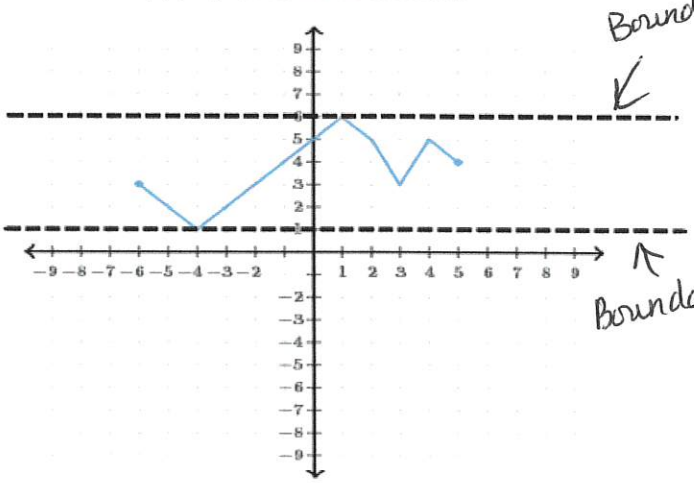
To find the domain look at the boundaries that all the points lie within in the x-direction

Domain is between -6 and 5

write in interval notation

[-6, 5]

The function $f(x)$ is graphed; what is its domain?



Boundary

Boundary

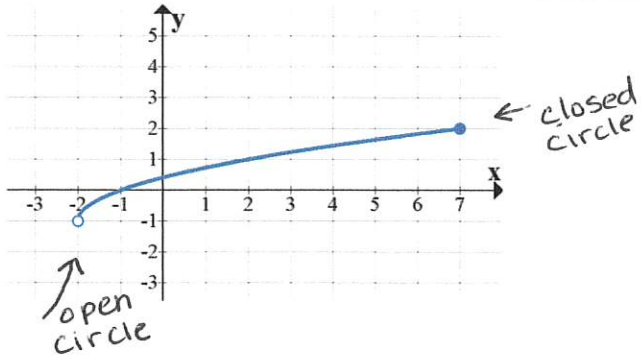
Same as domain except you need to check the boundaries in the y-direction.

Range is between 1 and 6

write in interval notation

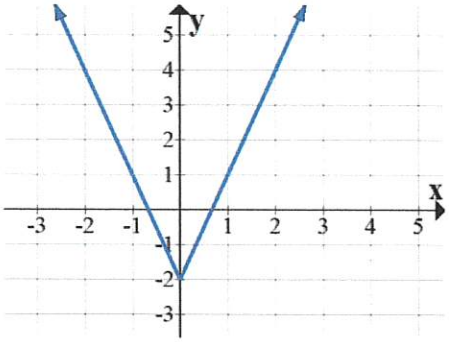
[1, 6]

More Examples



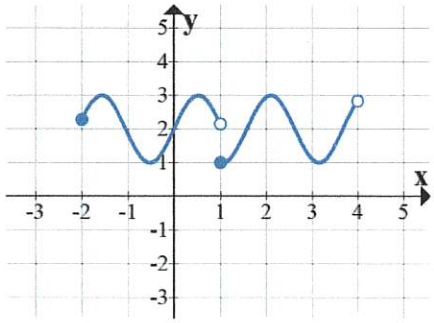
Domain: $(-2, 7]$

Range: $(-1, 2]$



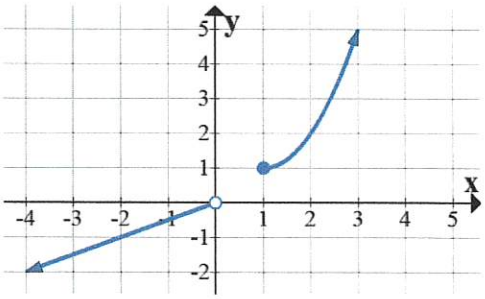
Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$



Domain: $[-2, 4)$

Range: $[1, 3]$



Domain: $(-\infty, 0) \cup [1, \infty)$

Range: $(-\infty, 0) \cup [1, \infty)$