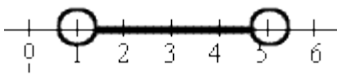
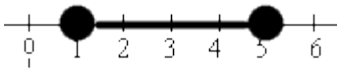
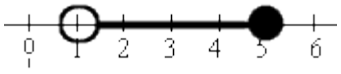
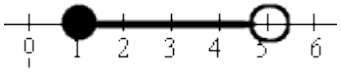
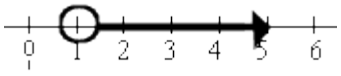
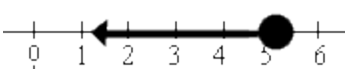
Set Notation versus Interval Notation

Domain and range are a very important and necessary skill in Math 20 – 1 and Math 30-1. They can be written using both set notation and 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 $a \leq x \leq b$ where the endpoints are included.	$[1, 5]$ 
Half–Open Interval: $(a, b]$ is interpreted as $a < x \leq b$ where a is not included, but b is included.	$(1, 5]$ 
Half–Open Interval: $[a, b)$ is interpreted as $a \leq x < b$ 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 $x \leq b$ where b is included and again, infinity is always expressed as being "open" (not included).	$(-\infty, 5]$ 

Example 1: Write the following set notation in interval notation.

a) $\{x|x \epsilon \not{R}\}$ _____

b) $\{y|y \epsilon \not{R}\}$ _____

c) $\{x|x \geq -5;\ x \epsilon \not{R}\}$ _____

d) $\{x|x \geq 3;\ x \epsilon \not{R}\}$ _____

e) $\{x|x \leq -11;\ x \epsilon \not{R}\}$ _____

f) $\{x|x \leq 18;\ x \epsilon \not{R}\}$ _____

g) $\{x|x > -16;\ x \epsilon \not{R}\}$ _____

h) $\{x|x > 20;\ x \epsilon \not{R}\}$ _____

i) $\{x|x < -31;\ x \epsilon \not{R}\}$ _____

j) $\{x|x < 17;\ x \epsilon \not{R}\}$ _____

k) $\{x|x \neq 9;\ x \epsilon \not{R}\}$ _____

l) $\{x|x \neq -6;\ x \epsilon \not{R}\}$ _____

m) $\{x|-1 < x < 3;\ x \epsilon \not{R}\}$ _____

n) $\{x|-1 \leq x < 3;\ x \epsilon \not{R}\}$ _____

o) $\{x|-1 < x \leq 3;\ x \epsilon \not{R}\}$ _____

p) $\{x|-1 \leq x \leq 3;\ x \epsilon \not{R}\}$ _____

q) $\{x|-5 < x < 9;\ x \epsilon \not{R}\}$ _____

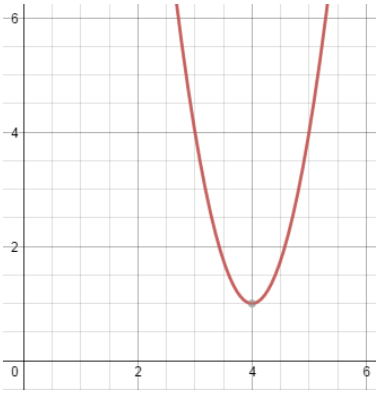
r) $\{x|-5 \leq x < 9;\ x \epsilon \not{R}\}$ _____

s) $\{x|-5 < x \leq 9;\ x \epsilon \not{R}\}$ _____

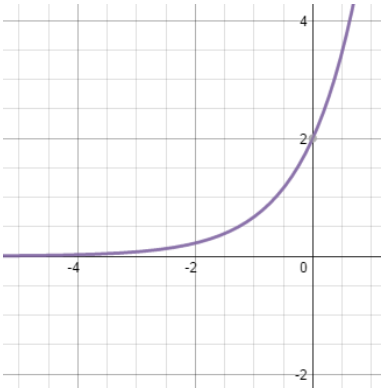
t) $\{x|-5 \leq x \leq 9;\ x \epsilon \not{R}\}$ _____

Example 2: State the domain and range in both set notation and interval notation.

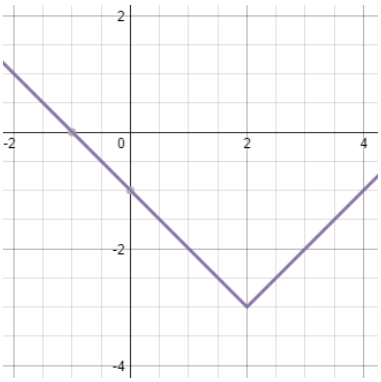
Quadratic Function



Exponential Function



Absolute Value Function



Rational Function