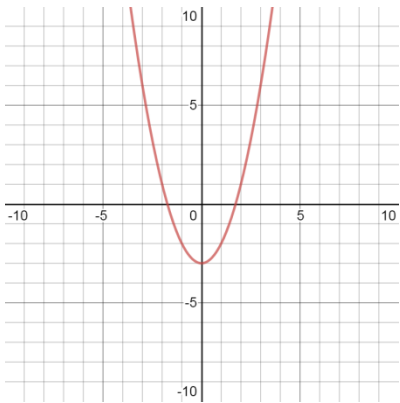


Key Features of Functions

Term	Definition
Domain	
Range	
Set Builder Notation	
Interval Notation	

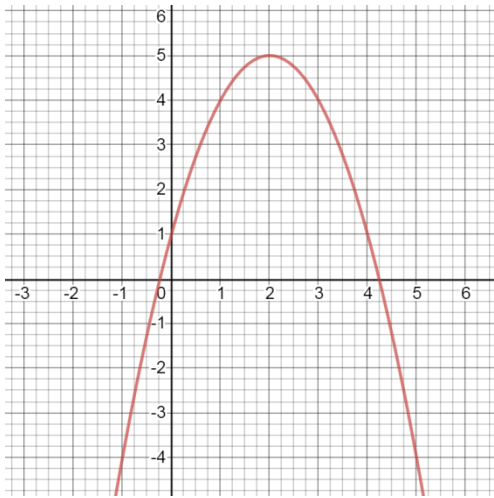
Domain & Range

Example 1: What are the domain and range of the function $y = x^2 - 3$?



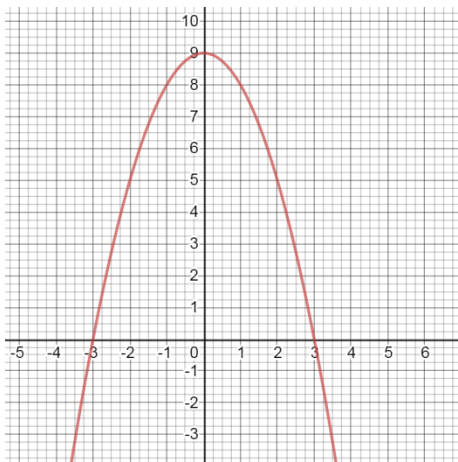
	Set Builder Notation	Interval Notation
Domain		
Range		

Example 2: A rocket water toy is launched from 1 foot below the surface of the water. The path of the toy is modeled by the function $y = -x^2 + 4x + 1$ where x is the time since the toy was launched. What are the domain and range of the function?



	Set Builder Notation	Interval Notation
Domain		
Range		

Example 3: What is the domain and range of the function $y = -x^2 + 9$?



	Set Builder Notation	Interval Notation
Domain		
Range		

Example 4: For what x -intervals are the functions in Examples 1-3 positive? Negative? Use interval notation.

Example	Positive	Negative
1		
2		
3		

IMPORTANT

We can find the domain of a function if it is given in graph form or equation form.

We will only find the range of a function if it is given in graph form.

Domain of Functions in Equation Form

1. _____
2. _____
3. _____

Example 5: Find the domain of each function. Use words first, then interval notation.

a) $y = 2x - 4$

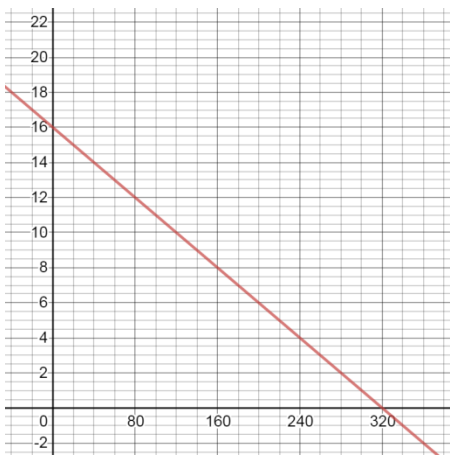
b) $y = |x - 4|$

c) $y = \sqrt{x + 3}$

d) $y = \frac{x-5}{x+6}$

Intercepts

Example 6: A car starts a journey with a full tank of gas. The equation $y = 16 - 0.05x$ relates the number of gallons of gas, y, left in the tank to the number of miles the car has traveled, x. What are the x- and y-intercepts and what do they represent?



x-intercepts	
y-intercepts	

Finding intercepts from equations:

1. To find x-intercept _____

2. To find y-intercept _____

Example 7: Find the x- and y-intercepts of the following functions:

a) $y = |x| - 3$

b) $y = 4 - x^2$

c) $y = 2x - 6$

x-intercepts	
y-intercepts	

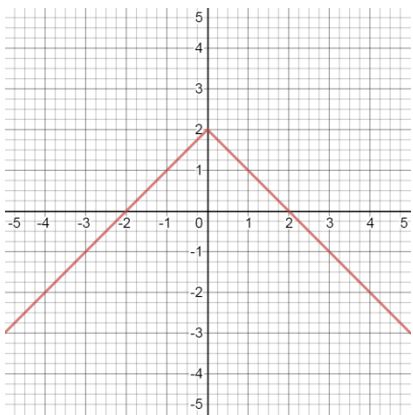
x-intercepts	
y-intercepts	

x-intercepts	
y-intercepts	

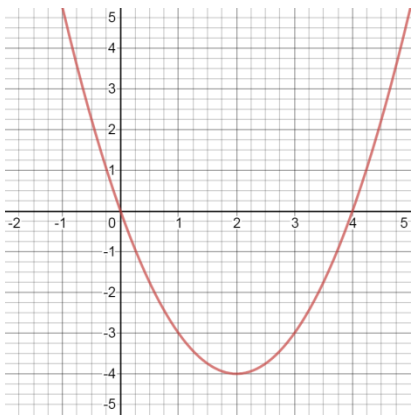
Increasing & Decreasing

Example 8: Give the x-intervals where the functions below are increasing and decreasing and where they are positive and negative. Use interval notation.

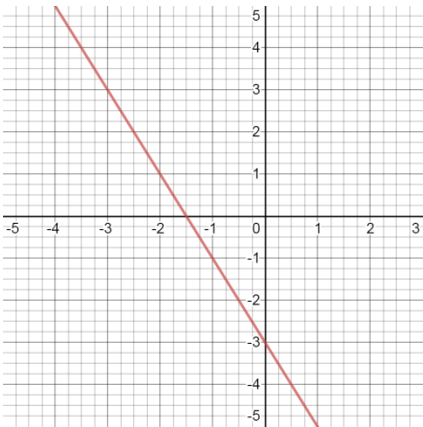
a) $y = 2 - |x|$



b) $y = x^2 - 4x$



c) $y = -2x - 3$



Increasing	
Decreasing	
Positive	
Negative	

Increasing	
Decreasing	
Positive	
Negative	

Increasing	
Decreasing	
Positive	
Negative	

Average Rate of Change of a Function over an Interval

Example 9: What do the average rates of change over the following intervals indicate about each given function? Intervals: [-2, 0], [0, 3], [-2, 3]

a) $y = 1$

b) $y = 2x - 1$

c) $y = x^2$

d) $y = |x| + 2$