

What is a Function?

A function is a relationship between variables where there is only one dependent variable associated with any given independent variable.

x : independent variable

$f(x)$: dependent variable

Inverse

The inverse of a function can be determined by exchanging the independent and dependent variables of a function.

Example:

x	$f(x)$	x	$f(x)$
0	2	2	0
4	5	5	4
8	8	8	8

Properties

Domain: The domain of a function is the set of allowable x -values. Read the graph from left to right along the x -axis.

Range: The range of a function is the set of allowable y -values. Read the graph from bottom to top along the y -axis.

y -intercept: Where the graph intersects the y -axis.

zeros (or x -intercept): Where the graph intersects the x -axis.

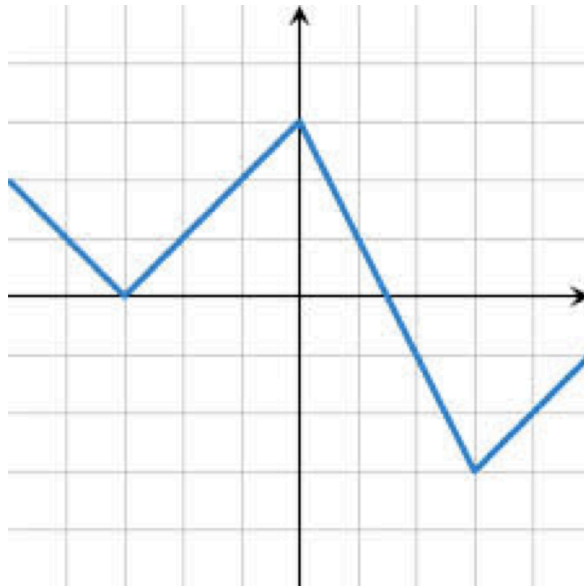
Variation: The variation is the interval where the function is **increasing** or **decreasing** or **constant**. Read the graph from left to right along the x -axis.

Sign: The sign of a function is the interval where the function is **positive** or **negative**. The function is positive when it is above the x -axis and negative when it is below the x -axis.

Extrema: The **maximum** is the largest y -value and the **minimum** is the smallest y -value.

Note: A set is represented in [square brackets] if representing an interval and {squiggle brackets} is representing a list of values.

Example



Properties

Domain: $[-5, 5]$

Range: $[-3, 3]$

y-intercept: $y=3$

zeros: $x= -3$ and $x= 1.5$

Variation:

Increasing: $[-3, 0] \cup [3, 5]$

Decreasing: $[-5, -3] \cup [0, 3]$

Sign:

Positive: $[-5, 1.5]$

Negative: $[1.5, 5]$

Extrema:

Maximum: $y= 3$

Minimum: $y= -3$