Intro to Functions

Objectives

1. Determine if a relation is a function.
2. Evaluate a function using function notation.

Relations and Functions

Relations

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Domain

The **domain** is the set of all input values (usually x) of a relation.

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Range

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Function

A **function** is a relation is which each element of the domain has only 1 element in the range.

Example 1

Determine whether each relation represents a function. For those that do, state the domain and range.

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Domain: 1, 2, 3, 4

Range: 5, 7, 8

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(b) $\{(5,1),\ (5,2),\ (7,3),\ (8,4)\}$

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x-coordinates are not all different. Is **not** a function.

Vertical Line Test

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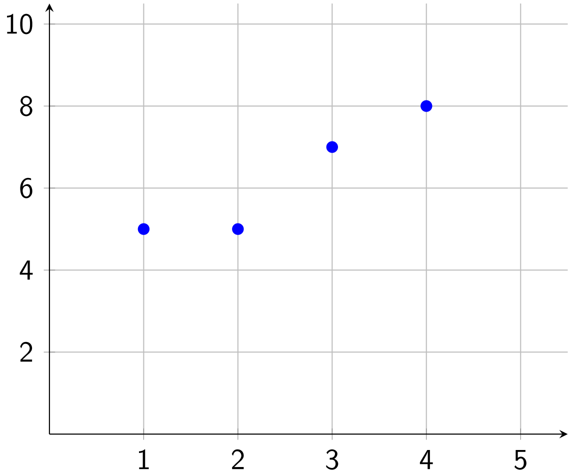
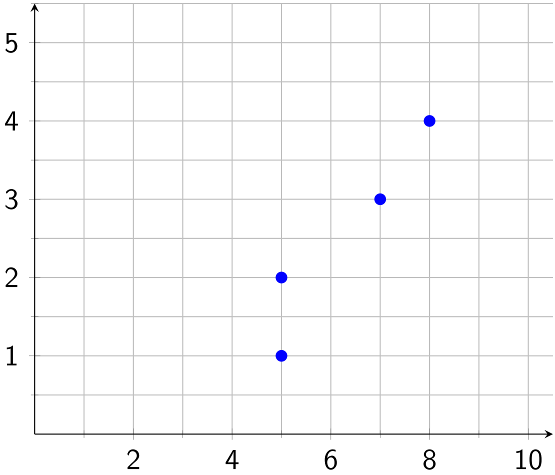
If every vertical line drawn hits the graph **at most once**, then the relation is a function.

Example 1a Passes V.L.T.



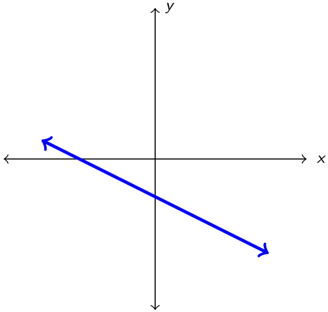
Example 1b Fails V.L.T.



Example 2

Determine whether the graph of each represents a function.

(a)



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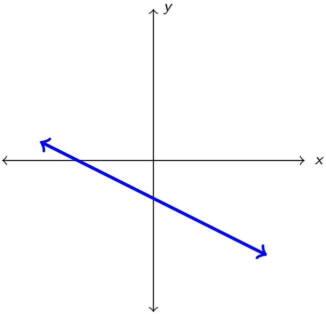
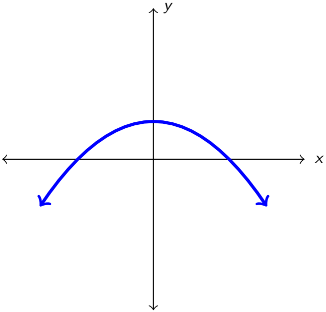


Is a function

Example 2

(b)



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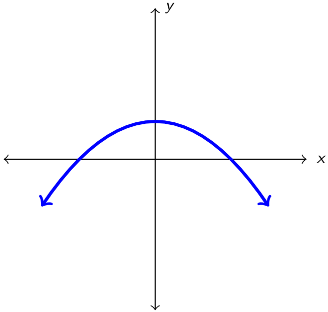
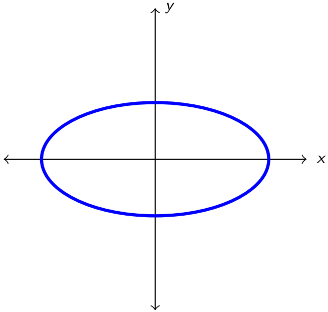


Is a function

Example 2

(c)



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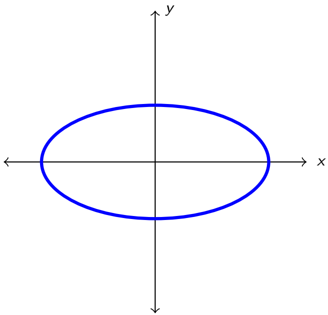

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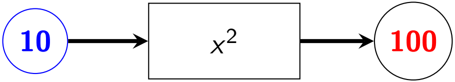
For instance, if you input 10 into the x^2 function, it will return 10^2, or 100:



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When we substitute a value for the variable and evaluate it, that is called **evaluating the function**.

Example 3

Evaluate $f(2)$, $f(-2)$, and $f(0)$ for each.

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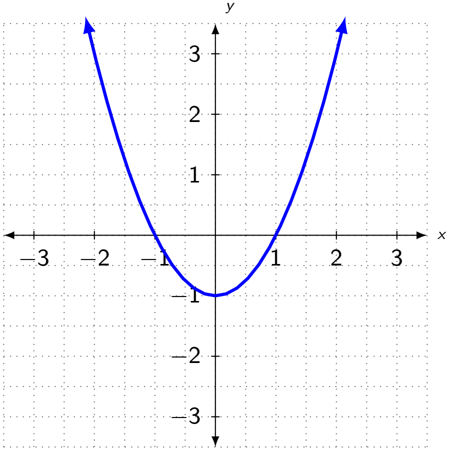

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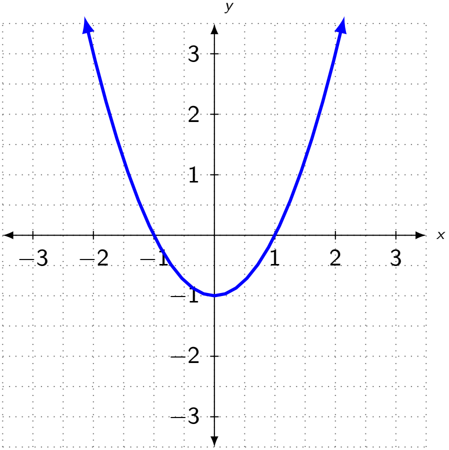

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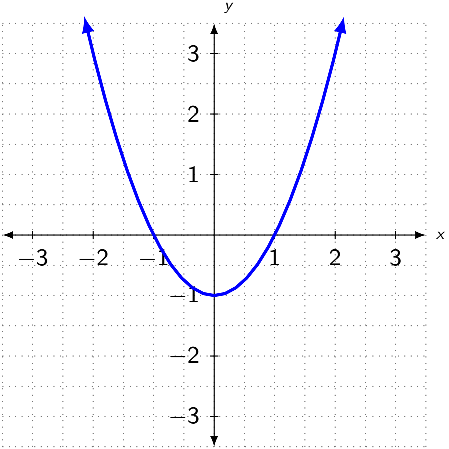

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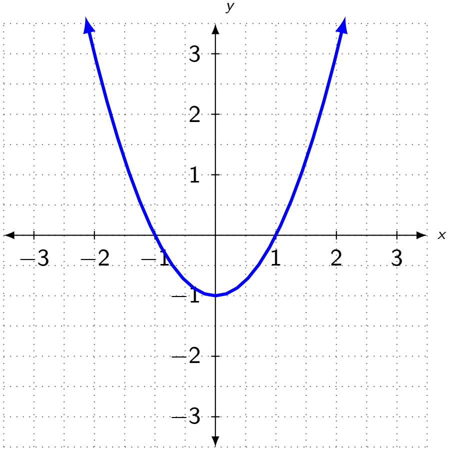

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