

A relation

A **relation** is a correspondence that matches up two sets of objects. The first set is called the domain, and the set of all corresponding elements is called the range.

<u>Manufacturer</u>	<u>Model</u>	<u>Model</u>	<u>U.S. Sales</u>
Toyota	Camry	Camry	302,636
	Corolla	Corolla	274,074
Honda	Accord	Accord	250,663
	Civic	Civic	225,212
Chevrolet	Impala	Impala	197,304

Source: Forbes.com

A function

A **function** is a relation in which every element in the domain corresponds to one and only one element in the range.

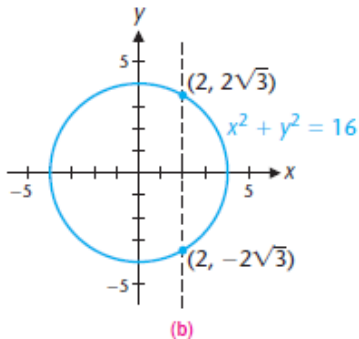
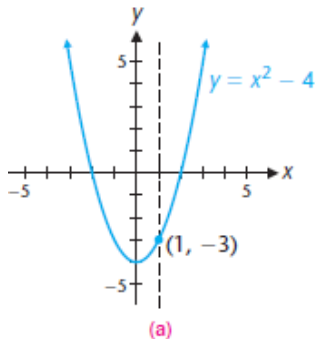
› THEOREM 1 Vertical Line Test for a Function

An equation defines a function if each vertical line in the rectangular coordinate system passes through at most one point on the graph of the equation.

If any vertical line passes through two or more points on the graph of an equation, then the equation does not define a function.

A function

Determine which graph below is the graph of a function



Example Find the domain of the function defined by the equation

$$y = \sqrt{x + 2}$$

Evaluating functions

Given $f(x) = x^2 - 2x + 1$, compute

① $f(-2)$

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③ $f(2 + h)$

Evaluating functions

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① $f(-2)$

② $f(a^2)$

③ $f(2 + h)$

④

$$\frac{f(a + h) - f(a)}{h}$$

Find the domain of

① $g(t) = 5 + 2t - t^2$

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②

$$F(w) = \frac{5}{w^2 - 9}$$

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$$F(w) = \frac{5}{w^2 - 9}$$

③ $g(s) = \sqrt{3 - x}$