

Section 2.1 What is a Function? Main Concepts

Function

Independent variable

Dependent variable

Domain

Range

Section 2.2 Graphs of Functions Main Concepts

Graphs as representations of functions

Families of graphs

Domain and Range from Graph

Vertical Line Test

Interpreting graphs

A function 'f' is a rule that assigns to each element x in a set A exactly one element, called f(x), in a set B.

Examples:

Given 'radius' of a circle, follow rule to find 'Area'

Given 'time' after it is dropped, follow rule to find 'height' of ball

Given 'volume' of a cube, follow rule to find 'length' of a side

Representations of Functions

Verbal – by a description in words

Numerical – by a table of values

Algebraically – by explicit formula or equation

Visually – by a graph

The graph of 'f' is the set of all points (x,y) where $y=f(x)$.

Graph of Area of circle in terms of radius

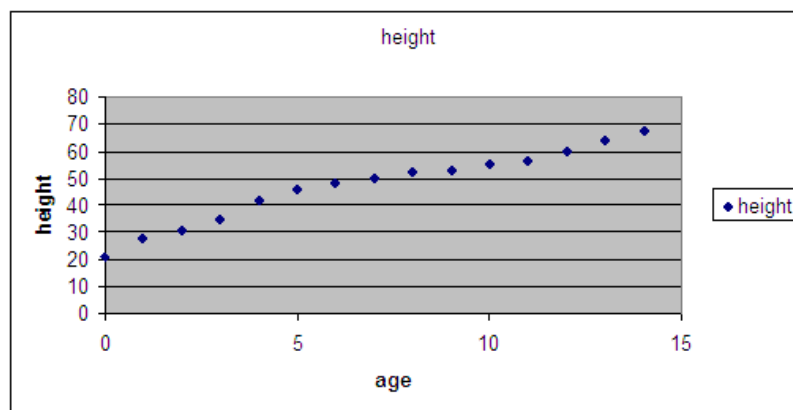
Graph of Average Daily High Temperature in terms of Time (Days after Jan 1)

Example: A persons height (in inches) is a function of his/her age (in years).

As a table

age	height
0	21
1	28
2	31
3	35
4	42
5	46
6	48
7	50
8	52
9	53
10	55
11	56
12	60
13	64
14	67

As a graph



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As a graph



As an (approximate) function

Line through (0,21) and (14,67) $y = 3.28x + 21$

“Best Fit Line” through all the points $y = 3.08x + 26.6$

Notation:

$f(x)$ means “apply the rule to x ”

$f(x-5)$ means “apply the rule to $x-5$ ”

$f(2)$ means “apply the rule to 2”

$$f(x) = x^2 - 3x$$

$$f(x) = (x + 3)^2$$

$$f(x) = \sqrt{(x + 3)}$$

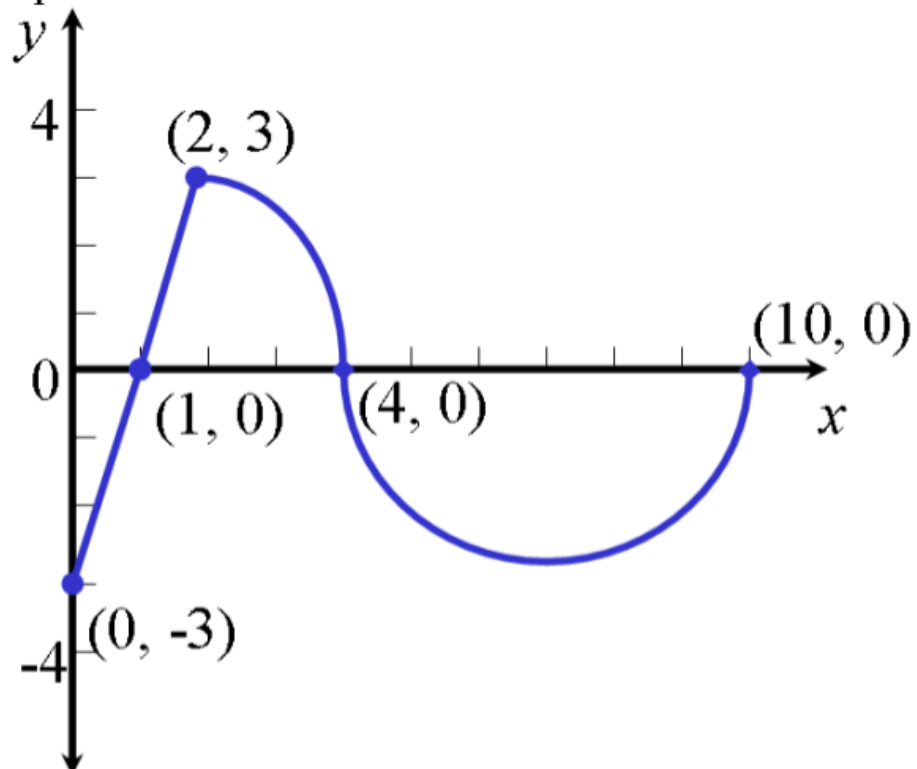
Find the domain of the following functions:
Domain is the set of values that can
be plugged in to the function legally

$$f(x) = 2x - 1$$

$$g(x) = \frac{x}{x-1}$$

$$h(x) = \sqrt{4-x}$$

Determine the domain, range, and intercepts of the following graph.



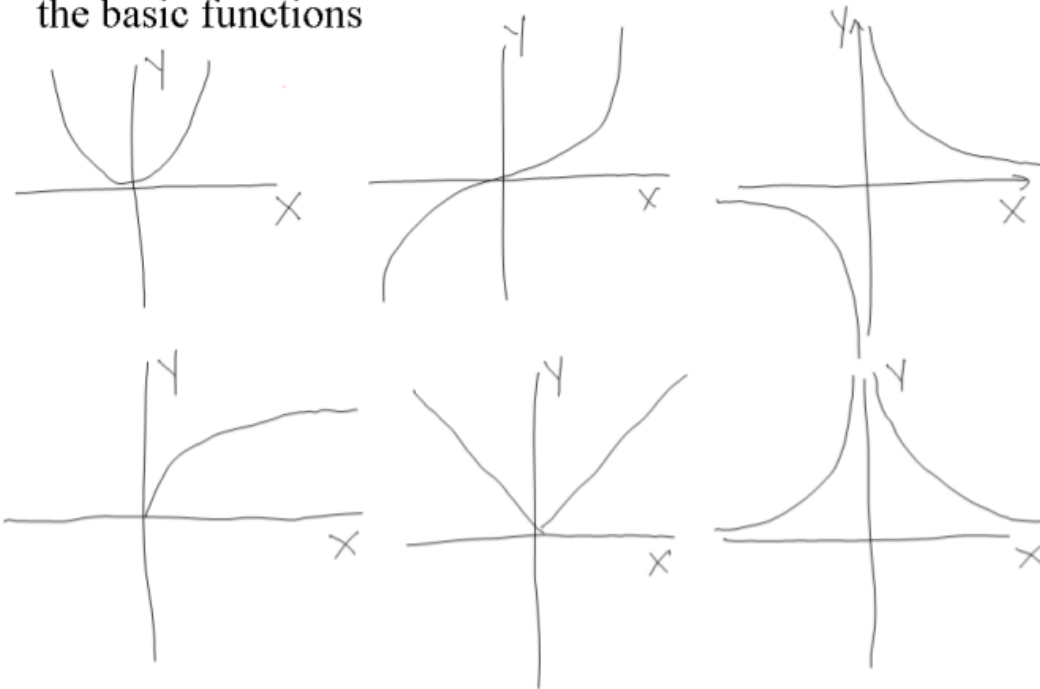
Sec. 2.1 # 43 Find the domain of the functions:

$$f(x) = \frac{x+2}{x^2-1}$$

$$f(x) = \frac{\sqrt{3-2x}}{x+5}$$

Sec. 2.1 # 71 You place a frozen pie in an oven and bake it for one hour. Then you take it out and let it cool for two hours before eating it. Sketch a rough graph of the temperature of the pie as a function of time.

HW Problems from Sec. 2.1 and 2.2
 Determine which of the following graphs represent
 the basic functions



Sec. 2.2 #84 The following graph gives a salesman's distance away from home as a function of time on a certain day. Describe in words what the function says about his travels on that day.

