Math122 College Algebra

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3.2
Graphs of Functions

- To graph a function f the points $(x, f(x))$ are plotted in the coordinate plane

- Graph of a Function: If f is a function with domain A, the graph of f is $\{(x, f(x)|x \in A\}$

- Write down in English the meaning of $\{(x, f(x)|x \in A\}$

Graphs of Functions

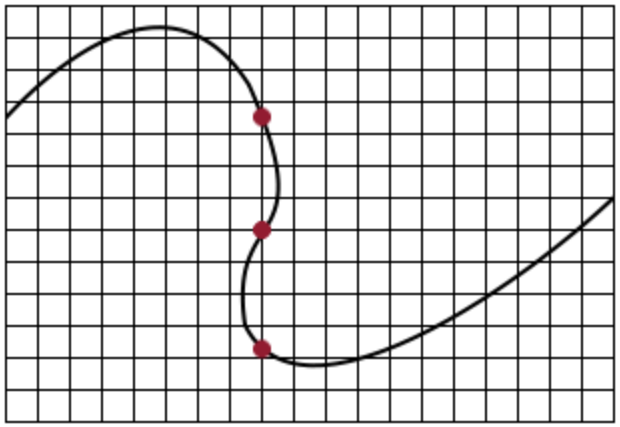
- The graph of function f is the graph of the equation $y = f(x)$
- Sketch the graph of each of the following functions
  1. $f(x) = \sqrt{x}$ (what is the domain and range?)
  2. $f(x) = 2^x$ (what is the domain and range?)

Graphing Piecewise Defined Functions

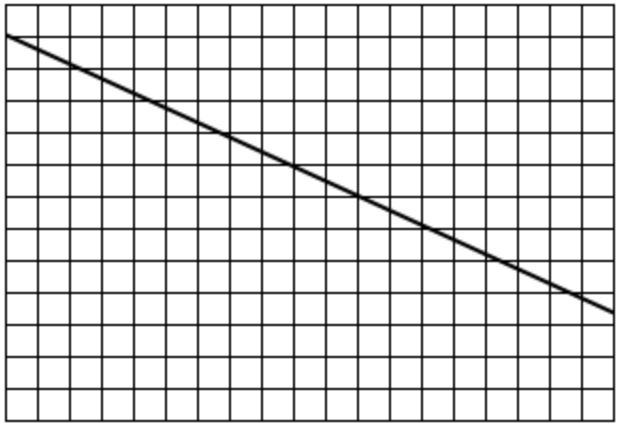
- Graph the function $f(x) = \begin{cases} x^2 & if\ x \leq 1 \\ 2x + 1 & if\ x > 1 \end{cases}$

The Vertical Line Test

- The graph of a curve in the coordinate plane is a function if and only if no vertical line intersects the curve more than once



Not a function



Function

http://en.wikipedia.org/wiki/File:Vertical_line_test.png

Equations That Define Functions

- The equation $y - x^2 = 0$ defines a relationship between x and y
- To find out if the equation defines y as a function of x solve for y
- The equation $y = x^2$ defines a rule (function) that gives one value of y for each x
- We can express the rule in function notation $f(x) = x^2$

Problem

- Does the equation define y as a function of x?

1. $y + x^2 - 2 = 0$

2. $x^2 + y^2 = 9$

Problem

- Does the equation define y as a function of x?

  3. $x = y^3$