Piecewise-Defined Functions

UNIVERSITY OF MINNESOTA

Preliminaries and Objectives

Preliminaries
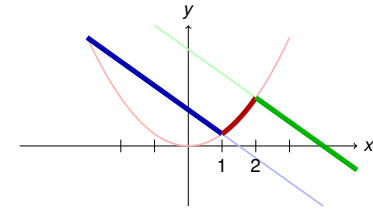- Graphs of common functions

Objectives
- Graph a piecewise-defined functions

Example 1

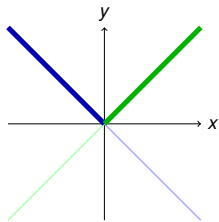$$f(x) = \begin{cases} 3 - 2x & \text{if } x < 1 \\ x^2 & \text{if } 1 \le x \le 2 \\ 8 - 2x & \text{if } x > 2 \end{cases}$$
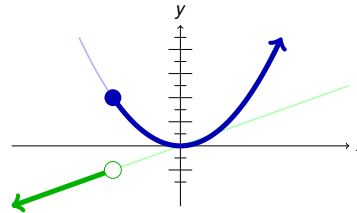
Example 2

$$f(x) = |x|$$

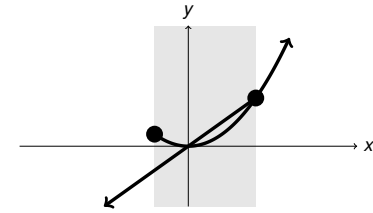$$f(x) = \begin{cases} x & \text{if } x \ge 0 \\ -x & \text{if } x < 0 \end{cases}$$

Example 3

$$f(x) = \begin{cases} x & \text{if } x < -2 \\ x^2 & \text{if } x \ge -2 \end{cases}$$

Example 4 - Not a Function

$$f(x) = \begin{cases} x & \text{if } x \le 2 \\ x^2 & \text{if } x \ge -1 \end{cases}$$

Recap

$$f(x) = \begin{cases} f_1(x) & \text{if } x \in D_1 \\ f_2(x) & \text{if } x \in D_2 \end{cases}$$

Graph $f_1(x)$ on D_1 and
$f_2(x)$ on D_2