

Piecewise-Defined Functions



Preliminaries and Objectives

Preliminaries

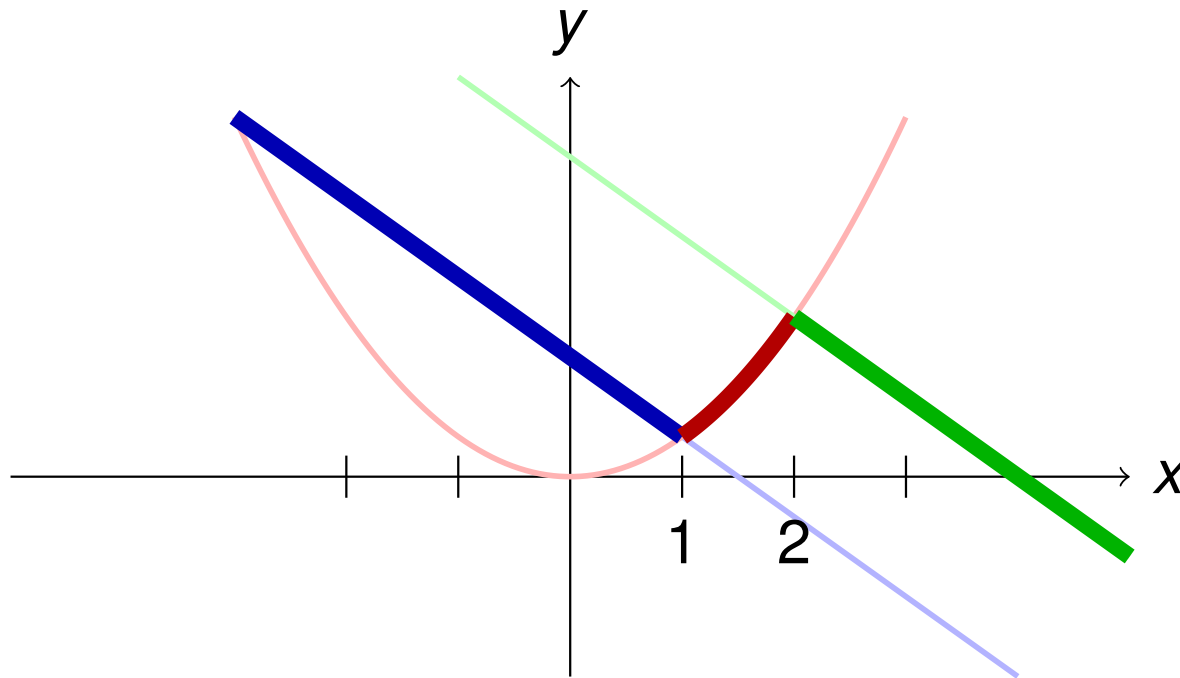
- Graphs of common functions

Objectives

- Graph a piecewise-defined functions

Example 1

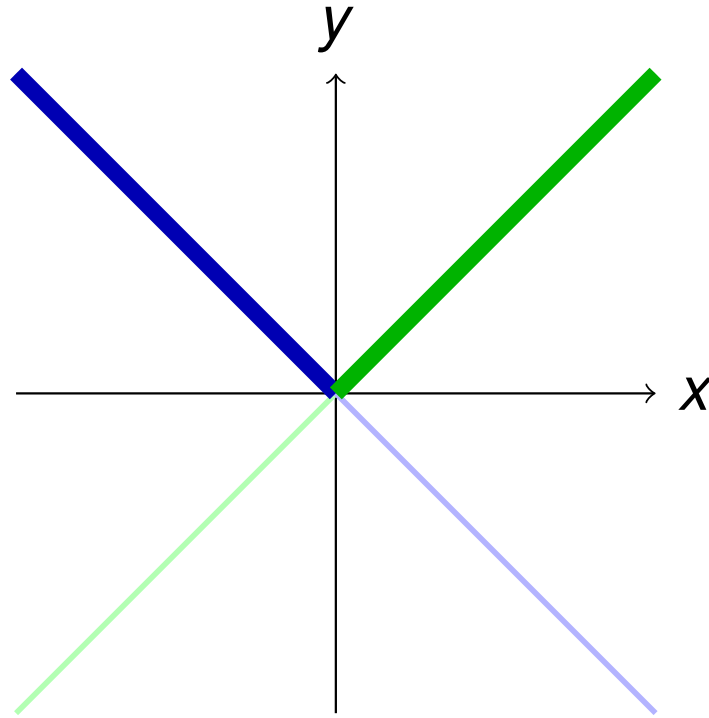
$$f(x) = \begin{cases} 3 - 2x & \text{if } x < 1 \\ x^2 & \text{if } 1 \leq x \leq 2 \\ 8 - 2x & \text{if } x > 2 \end{cases}$$



Example 2

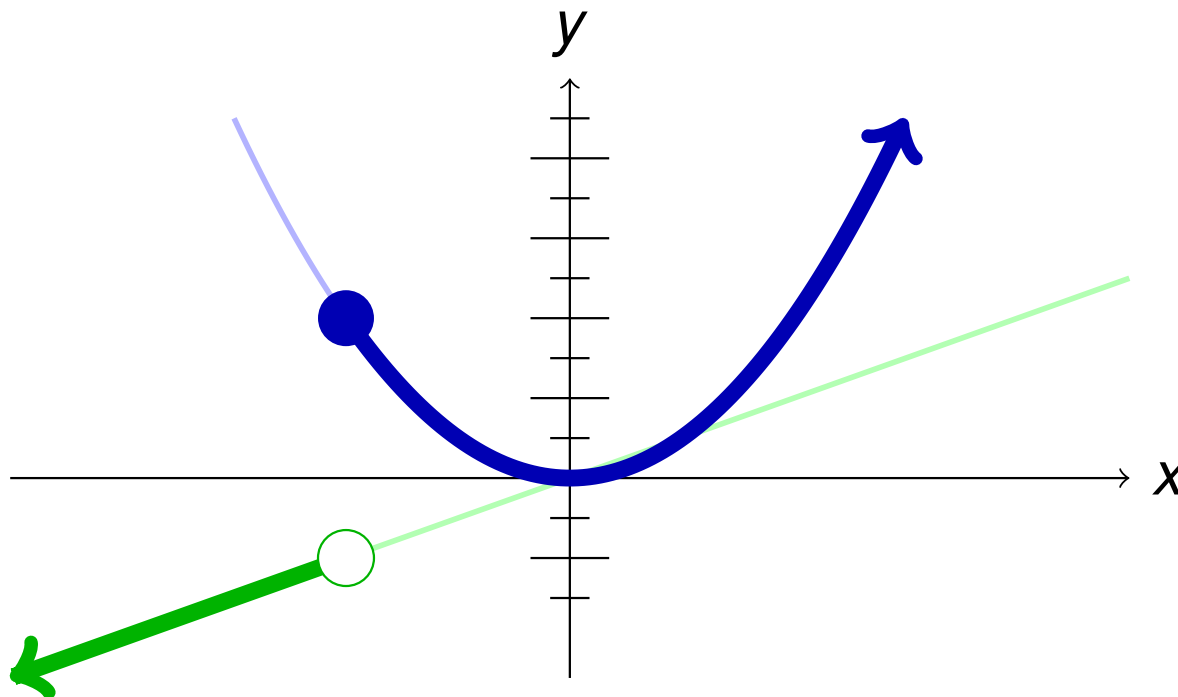
$$f(x) = |x|$$

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



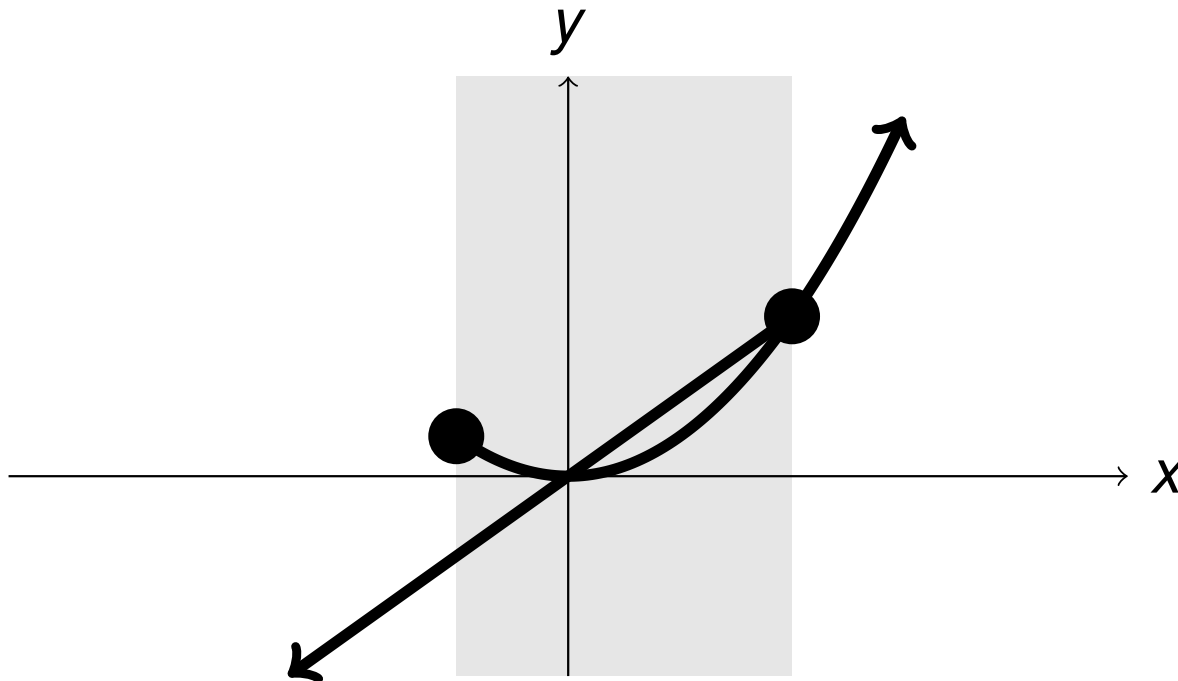
Example 3

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



Example 4 - Not a Function

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



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