

## Graphs of piecewise functions

Sketch a graph of each of the following. Be sure to label all  $x$  and  $y$  intercepts as well as any endpoints, holes, and vertices.

- $$f(x) = \begin{cases} 2x + 4 & \text{if } x \leq 1, \\ -x + 6 & \text{if } x > 3, \end{cases}$$
- $$f(x) = \begin{cases} 3 & \text{if } x \leq -2, \\ x & \text{if } -2 < x \leq 1, \\ -4 & \text{if } 3 < x \leq 6. \end{cases}$$
- $$f(x) = \begin{cases} -(x + 4)^2 + 2 & \text{if } x < -1, \\ 4x - 3 & \text{if } -1 < x < 2, \\ (x - 3)^2 + 4 & \text{if } x > 2. \end{cases}$$
- $$f(x) = \begin{cases} \sqrt{-x} & \text{if } x < 0, \\ -(x - 1)^2 + 1 & \text{if } 0 \leq x \leq 2, \\ \sqrt{x - 2} & \text{if } x > 2. \end{cases}$$
- $$f(x) = \begin{cases} -|x| + 4 & \text{if } -3 \leq x \leq 2, \\ -1 & \text{if } 3 < x < 4, \\ (x - 6)^2 - 5 & \text{if } x > 4. \end{cases}$$
- $$f(x) = \begin{cases} 4 & \text{if } -10 < x \leq -6, \\ 2|x + 3| - 3 & \text{if } -5 < x < -2, \\ -3x + 1 & \text{if } 0 < x \leq 2, \\ (x - 4)^2 & \text{if } 2 < x < 5, \\ \sqrt{x - 5} + 1 & \text{if } 5 < x < 9. \end{cases}$$