

**Section 2.2: Piecewise Defined Functions**

Don't worry about the curve shifting concepts from this section.

**Evaluation and Domains:**

Example: Use  $f(x)$  to compute the following.

$$f(x) = \begin{cases} -x^2 + 7 & \text{if } x \leq 1 \\ 3x + 4 & \text{if } x > 1 \end{cases}$$

$$f(0) = \qquad \qquad \qquad f(10) =$$

$$f(-1) = \qquad \qquad \qquad f(1) =$$

domain of  $f(x)$ :

Example: Find the domain of these functions.

$$\text{A) } g(x) = \begin{cases} \sqrt{x-1} & \text{if } x \geq 0 \\ \frac{3}{x} & \text{if } x < 0 \end{cases}$$

$$\text{B) } h(x) = \begin{cases} \frac{4x}{x+2} & \text{if } x \geq 2 \\ \frac{x}{x^2-5} & \text{if } x < 2 \end{cases}$$

$$\text{C) } k(x) = \begin{cases} 3x & \text{if } x > 1 \\ 2x - 1 & \text{if } x < 1 \end{cases}$$

**Graphing:**

Graph these functions.

$$f(x) = \begin{cases} 6x - 4 & \text{if } x \leq 2 \\ 7 - 2x & \text{if } x > 2 \end{cases}$$

$$y = \begin{cases} 4 & \text{if } x \leq -1 \\ 2x + 1 & \text{if } -1 < x < 5 \\ 3x - 4 & \text{if } x \geq 5 \end{cases}$$

**Setting up:**

Find(construct) the piecewise function that will represent the electric bill, for a small business, that uses  $x$  kilowatts of electricity during a month.

The electric company has a monthly charge of \$9 for having the electricity connected. The electric company bills the first 1,000 kwh(kilowatt hours) at a rate of \$0.0801/kwh. All additional kilowatt-hrs over 1000kwh is charged at a rate of \$0.0612/kwh.