

# Piecewise-Defined Functions Video Lecture

## Section 2.4

### Course Learning Objectives:

- 1) Demonstrate an understanding of functional attributes such as domain and range. Determine these attributes for a function given its graph and/or its rule.
- 2) Graph piecewise defined functions and use such graphs to solve applied problems and to understand the significance of attributes of the graph to such applied problems.

### Weekly Learning Objectives:

- 1) Graph piecewise-defined functions.
- 2) Evaluate piecewise-defined functions.
- 3) Find the domain and range of a piecewise-defined function.
- 4) Use a piecewise-defined function to model an application.

## Piecewise-Defined Functions

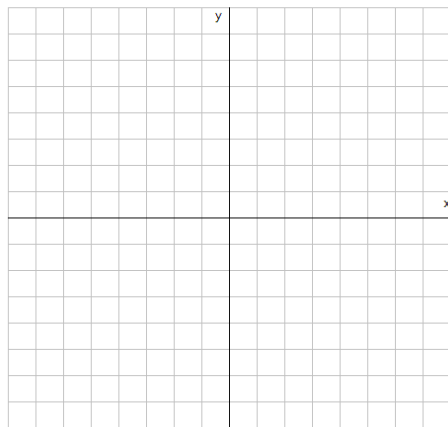
$$f(x) = \begin{cases} 3x+4 & \text{if } x < 0 \\ -x+2 & \text{if } x \geq 0 \end{cases}$$

Evaluate:

$$f(-4) =$$

$$f(3) =$$

$$f(0) =$$

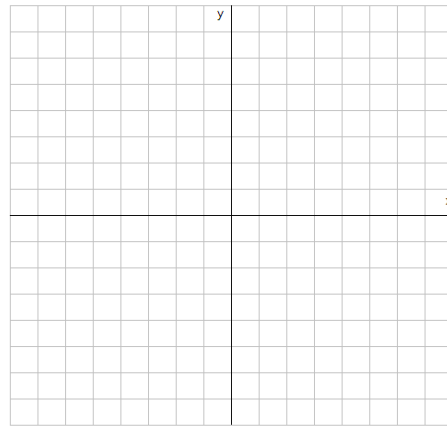


$$g(x) = \begin{cases} -1 & \text{if } x \leq 0 \\ -3 & \text{if } x \geq 2 \end{cases}$$

$$g(-5) =$$

$$g(0) =$$

$$g(5) =$$



Domain:

Range:

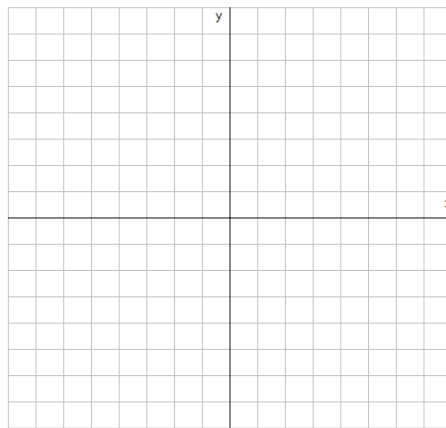
$$f(x) = \begin{cases} -\frac{1}{2}x & \text{if } x \leq 0 \\ x+1 & \text{if } 0 < x < 2 \\ 2x-1 & \text{if } x > 2 \end{cases}$$

$f(3) =$

$f(0) =$

$f(-3) =$

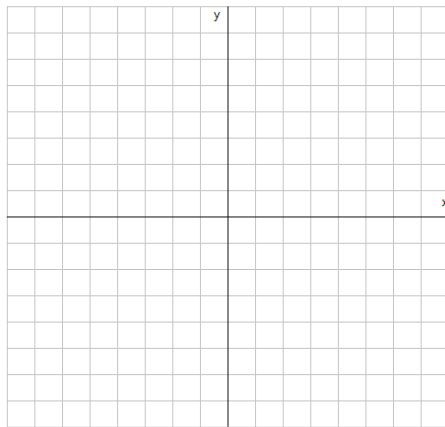
$f(1) =$



Domain:

Range:

$$f(x) = \begin{cases} x^2 & x < -1 \\ 3 & x = -1 \\ |x| & -1 < x < 1 \\ \sqrt{x} & x \geq 1 \end{cases}$$



Domain:

Range:

The electric company supplies electricity to residents for a monthly customer charge of \$7.58 plus 8.275 cents per kilowatt-hour (kWhr) for the first 400 kWhr supplied in the month and 6.208 cents per kWhr for all usage over 400 kWhr in the month. Find a model relating the monthly charge,  $C$ , to the kilowatt-hours,  $x$ , used.