

## 1.6 Piecewise Functions



### Math Learning Target:

"I can graph all piecewise functions.

I know how to apply piecewise functions in a problem.

I know how to determine if a function is continuous.

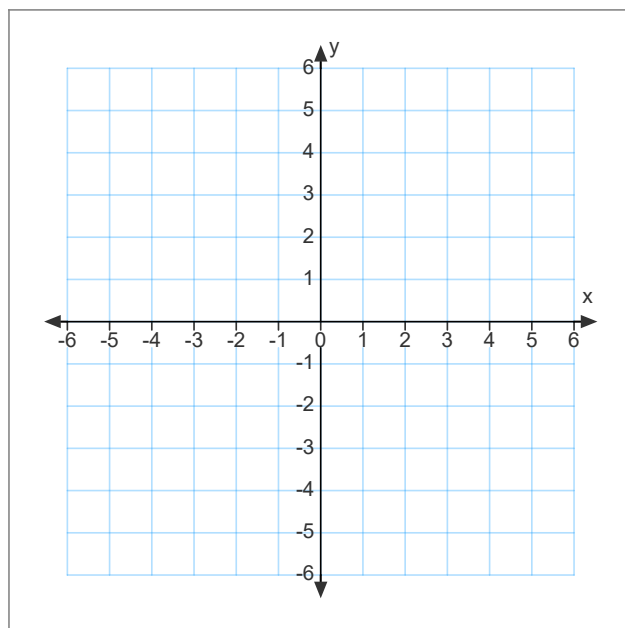
If a function is discontinuous, I know how to describe the discontinuity."

A **piecewise function** is a function defined by using two or more functions, on two or more intervals.

**Recall:**  $f(x) = |x|$  defines the distance the value  $x$  is from the origin.

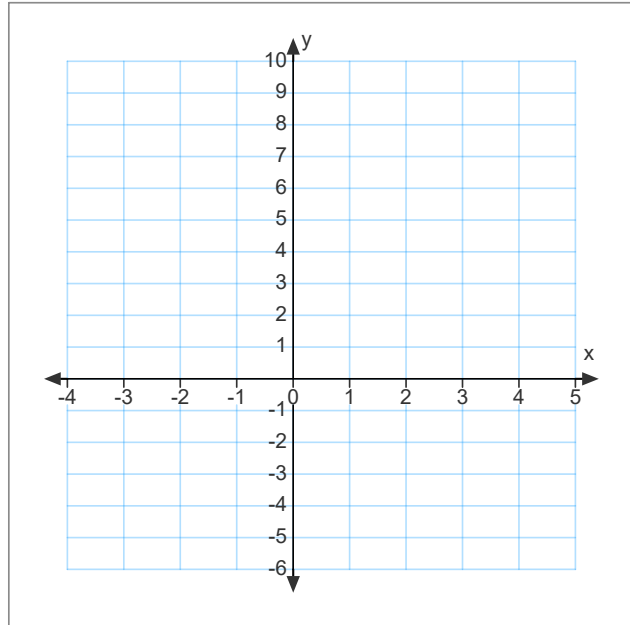
The absolute value function may be expressed as a piecewise function.

$$f(x) = |x| = \begin{cases} x & \text{when } x > 0 \\ -x & \text{when } x \leq 0 \end{cases}$$



**Ex. 1:** Graph:

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



*Click here for the video: "Continuity of Functions: Photostory"*  
*(The video is posted in our Google Classroom for your convenience).*



A function is **continuous** when there are no "holes", vertical asymptotes and "jumps" over its entire domain.

If the function is not continuous, it is **discontinuous**.

**Ex. 2:** Is the function in Ex. 1 continuous? Explain.

*If time: Discuss using GeoGebra*

Today's entertainment: pg. 51 #1bdf, 2bdf, 3a, 4a, 5d, 7, 9, 14, 15