Introduction to Determining Limits in Piecewise Functions

In this section, you will investigate how one-sided limits are applied to piecewise functions. You first saw piecewise functions when you wrote the equation for the absolute value of a linear or quadratic function in **Pre-Calculus 110**.



    

A **piecewise function** is one in which multiple functions (or sub-functions) are used to define it over different parts of its domain. For example:




The corresponding graph looks like this:



Therefore, this piecewise function is discontinuous at *x* = 1.

Let's investigate the limits as *x* approaches 1:




Based on the one-sided limits above, what do you know about the limit of *f* (*x*) as *x* approaches 1?



Because the left- and right-sided limits are not equal as *x* approaches 1, then the limit of the function does not exist as *x* approaches 1.