

Review the following:

Continuity at a Point on an Open Interval, Continuity of a Function over an interval, Existence of a Limit, ,  
Continuity over a Closed Interval, Intermediate Value Theorem,

Review Intermediate Theorem

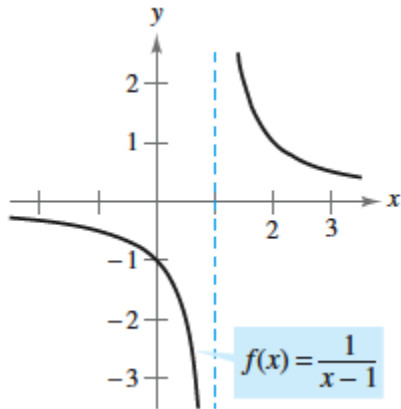
Review Asymptotes in Rational Functions

Review One-Sided Limits

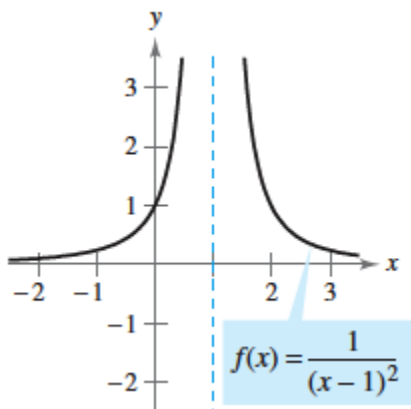
If  $\lim_{x \rightarrow c} f(x) \rightarrow \infty$ , then  $f(x)$  has a vertical asymptote at  $x = c$

Vertical Asymptotes can occur when the denominator approaches zero and the numerator does not.

Infinite Limits



$$\lim_{x \rightarrow 1^-} \frac{1}{x-1} = -\infty \quad \text{and} \quad \lim_{x \rightarrow 1^+} \frac{1}{x-1} = \infty$$



$$\lim_{x \rightarrow 1} \frac{1}{(x-1)^2} = \infty \quad \text{Limit from each side is } \infty.$$

If  $f(x)$  approaches  $+\infty$  or  $-\infty$  as  $x$  approaches  $c$  from the left or right, then the line  $x = c$  is a vertical asymptote of the graph of  $f$ . In reality, a limit can **never equal** infinity, but that statement is often used with the understanding that the meaning is that the limit **approaches** infinity.

### Assignment 104

#### 01.05 Infinite Limits

Page 88, #'s 1, 3, 6, 8, 10, 12, 14, 17, 19, 21, 24, 27, 28, 30, 32, 36, 42, 47, 50, 52