1.5 Infinite Limits

$\frac{0}{0}$ → Indeterminate → Reduce → Limit exists

$\frac{c}{0}$ → Limit DNE → $\pm\infty$

ex1) $f(x) = \frac{3}{x-2}$

Find the limit as x approaches 2 from the right and from the left.

$\lim_{x\to 2^+} \frac{3}{x-2} = \frac{3}{0}$ DNE, $+\infty$

x	y
3	3
4	3/2

$\lim_{x\to 2^-} \frac{3}{x-2} = \frac{3}{0}$ DNE, $-\infty$

x	y
0	-3/2
1	-3

infinite limit -- f(x) increases or decreases without bound as x approaches c.

The Limit DNE

-- f(x) approaches ± *infinity*

-- limit = constant over zero (k/0)

-- there is a *vertical asymptote* at c.

Sep 23-12:16 PM

ex2) $\lim_{x\to 1^-} \frac{1}{x-1} = \frac{1}{0}$ DNE

x	y
0	-1
1/2	-2

$-\infty$

3) $\lim_{x\to -1^+} \frac{1}{2(x+1)} = \frac{1}{0}$

x	y
0	1/2
1	1/4

$+\infty$

Sep 23-12:24 PM

ex 4) $\lim_{x\to 3^-} \left[\frac{5}{x^2-9}\right] = \frac{5}{0}$

DNE

x	y
1	-5/8
2	-1

$-\infty$

p84: #1-4,9-13odd,17,19,31,33,47

Sep 17-2:48 PM