

# 2012-2013 Spring Semester Math 1350

Day 1, Monday, January 14, 2013

## Chapter 3

### Section 3-1 Limits

#### The Definition of Limit

- Symbol:  $\lim_{x \rightarrow c} f(x) = L$
- spoken: "The limit, as  $x$  approaches  $c$ , of  $f(x)$  is  $L$ ."
- less-abbreviated symbols:  $f(x) \rightarrow L$  as  $x \rightarrow c$
- spoken: " $f(x)$  approaches  $L$  as  $x$  approaches  $c$ ."
- usage:  $x$  is a variable,  $f$  is a function  
 $c$  is a real number constant,  $L$  is a real number constant
- meaning: As  $x$  gets closer + closer to  $c$ , but not equal to  $c$ ,  
the value of  $f(x)$  gets closer + closer to  $L$ . (And may equal  $L$ .)
- graphical interpretation: The graph of  $f(x)$  appears to be  
heading for the location  $(x, y) = (c, L)$ .

Today: Graphical Approach to Limits

Class Drill I Limits on page 8 of the course packet.

Start with the row where  $x=1$

$f(1)$  DNE (does not exist) because there is no point on the graph at  $x=1$ . (There is a hole)

What about  $\lim_{x \rightarrow 1} f(x) =$  ??

When  $x$  is close to 1 but not equal to 1,  $y$  gets close to 3.

In symbols, this gets abbreviated  $\lim_{x \rightarrow 1} f(x) = 3$

In other words, the graph appears to be heading for the location  $(x,y) = (1,3)$ .

