

## 11.1 (B)

# Finding Limits Using Tables and Graphs

- Find the limit using a table
  - Find a limit by graphing
  - Find one-sided limits

# Limits

$$\lim_{x \rightarrow a} f(x) = L$$

**“The limit of  $f(x)$  as  $x$  approaches  $a$  equals the number  $L$ .” This means as  $x$  gets closer to  $a$ , but remains unequal to  $a$ , the corresponding values of  $f(x)$  get closer to  $L$ .**

# Finding Limits Using a Chart

1.  $\lim_{x \rightarrow 4} 3x^2$

$x$	3.9	3.99	3.999	4.001	4.01	4.1
$f(x)$	45.6	47.8	48.0	48.0	48.2	50.4

48

2.  $\lim_{x \rightarrow 0} \frac{x+1}{x^2+1}$

$x$	-0.1	-0.01	0	0.01	0.1
$f(x)$	0.89	0.99	1	1.01	1.11

1

# Finding Limits Using Tables

3.  $\lim_{x \rightarrow 0} \frac{\sin x}{x}$

$x$	-0.1	-0.01	0	0.01	0.1
$f(x)$	0.998	0.99998	<i>und</i>	0.99998	0.998

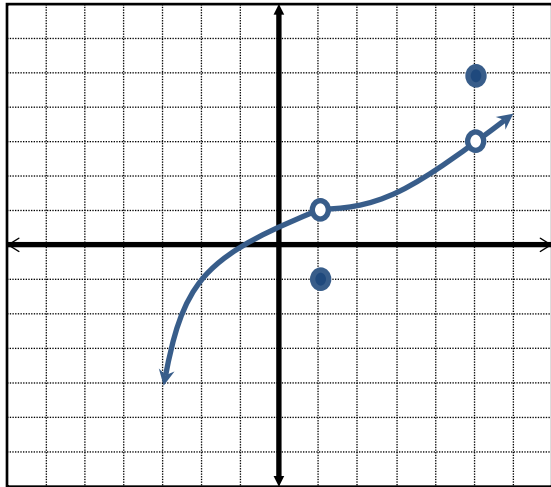
1

4.  $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$

$x$	-0.1	-0.01	0	0.01	0.1
$f(x)$	0.05	0.005	<i>und</i>	-0.005	-0.05

0

# Finding Limits Using a Graph



5.  $\lim_{x \rightarrow 1} f(x) = 1$

6.  $f(1) = -1$

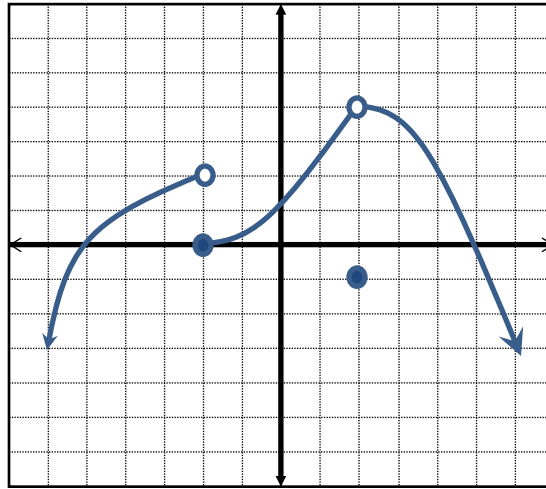
7.  $\lim_{x \rightarrow -2} f(x) = -1$

8.  $f(-2) = -1$

9.  $\lim_{x \rightarrow 5} f(x) = 3$

10.  $f(5) = 5$

# Finding One-Sided Limits



11.  $\lim_{x \rightarrow -2^-} f(x)$

=  $\boxed{2}$

12.  $\lim_{x \rightarrow -2^+} f(x)$

=  $\boxed{0}$

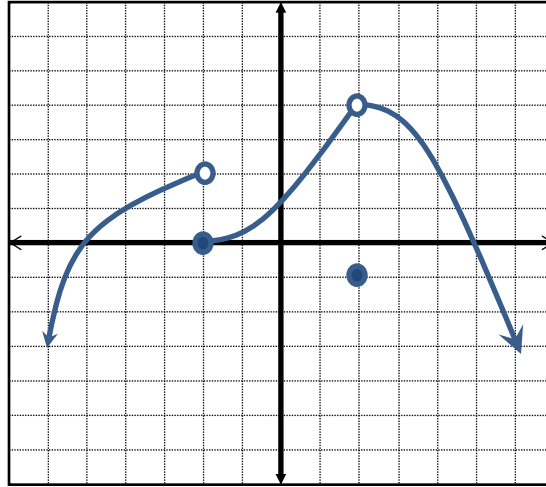
13.  $\lim_{x \rightarrow -2} f(x)$

=  $\boxed{DNE}$

14.  $f(-2)$

=  $\boxed{0}$

# Finding One-Sided Limits



15.  $\lim_{x \rightarrow 2^-} f(x)$

= 4

16.  $\lim_{x \rightarrow 2^+} f(x)$

= 4

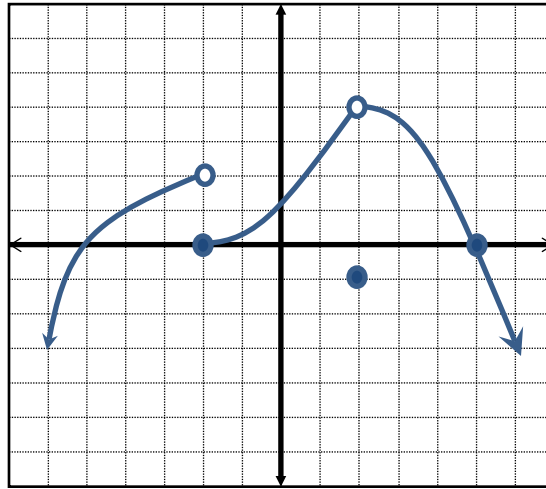
17.  $\lim_{x \rightarrow 2} f(x)$

= 4

18.  $f(2)$

= -1

# Finding One-Sided Limits



19.  $\lim_{x \rightarrow 5^-} f(x)$

= 0

20.  $\lim_{x \rightarrow 5^+} f(x)$

= 0

21.  $\lim_{x \rightarrow 5} f(x)$

= 0

22.  $f(5)$

= 0