

# CALCULUS

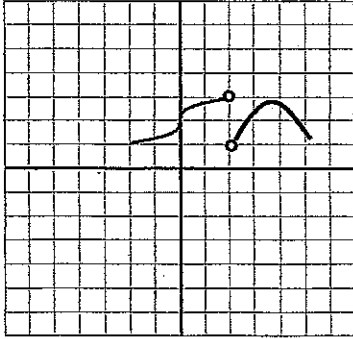
Name: \_\_\_\_\_

## Limits Review

Refer to the graph to find each limit, if it exists:

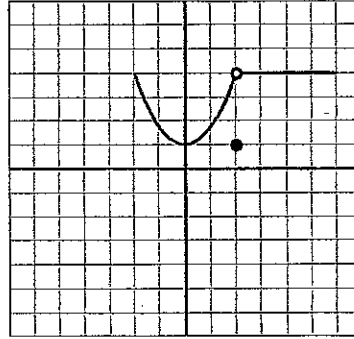
- a.  $\lim_{x \rightarrow 2^-} f(x)$    b.  $\lim_{x \rightarrow 2^+} f(x)$    c.  $\lim_{x \rightarrow 2} f(x)$    d.  $\lim_{x \rightarrow 0^-} f(x)$    e.  $\lim_{x \rightarrow 0^+} f(x)$    f.  $\lim_{x \rightarrow 0} f(x)$

1.



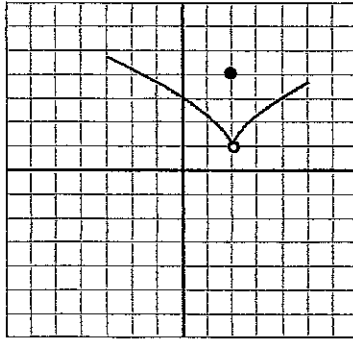
- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_

2.



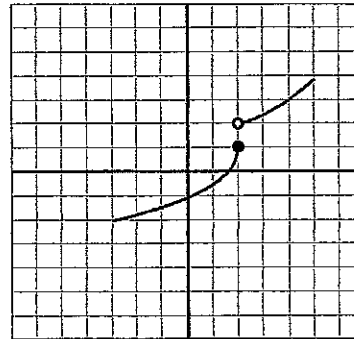
- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_

3.



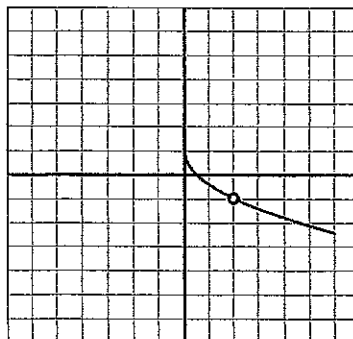
- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_

4.



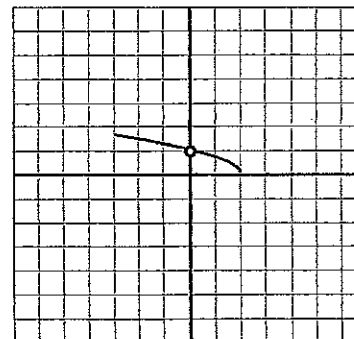
- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_

5.

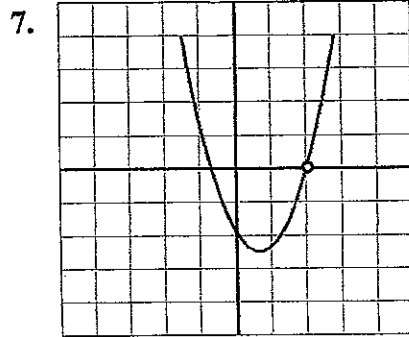


- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_

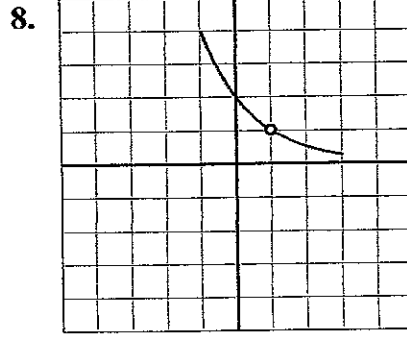
6.



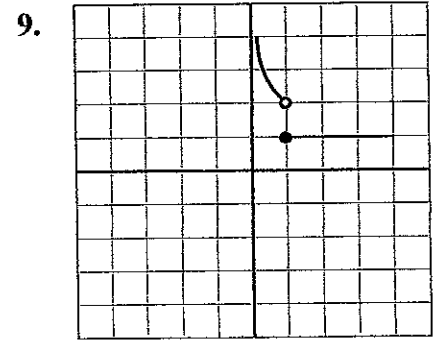
- a. \_\_\_\_\_   b. \_\_\_\_\_   c. \_\_\_\_\_  
d. \_\_\_\_\_   e. \_\_\_\_\_   f. \_\_\_\_\_



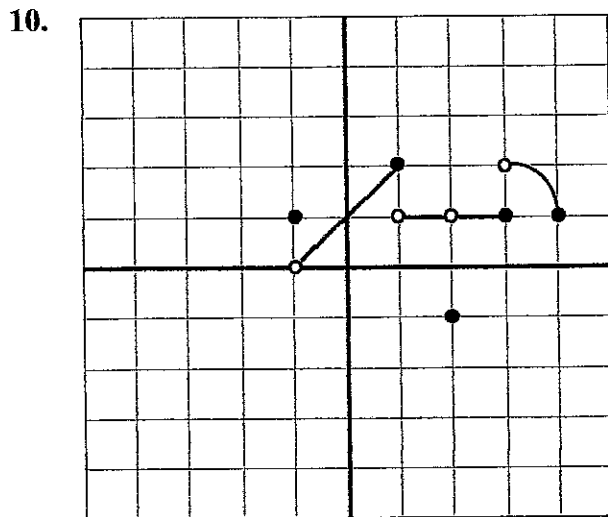
- a.  $\lim_{x \rightarrow 2} f(x) =$  \_\_\_\_\_  
 b.  $\lim_{x \rightarrow 0} f(x) =$  \_\_\_\_\_  
 c.  $f(2) =$  \_\_\_\_\_



- a.  $\lim_{x \rightarrow 1} f(x) =$  \_\_\_\_\_  
 b.  $\lim_{x \rightarrow 0} f(x) =$  \_\_\_\_\_



- a.  $\lim_{x \rightarrow 1^-} f(x) =$  \_\_\_\_\_  
 b.  $\lim_{x \rightarrow 1^+} f(x) =$  \_\_\_\_\_  
 c.  $\lim_{x \rightarrow 1} f(x) =$  \_\_\_\_\_  
 d.  $f(1) =$  \_\_\_\_\_

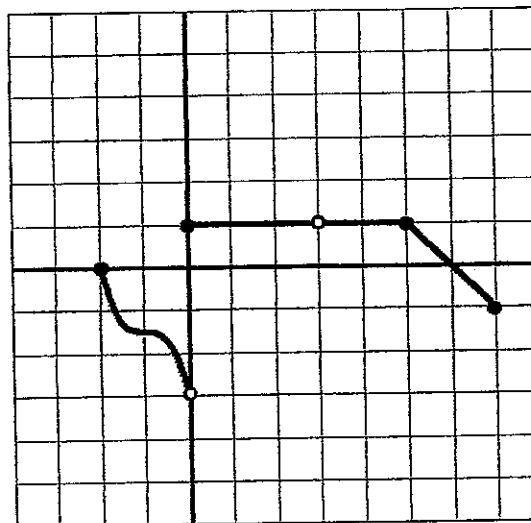


True or false?

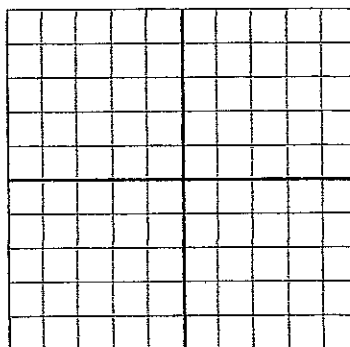
- \_\_\_\_\_ a.  $\lim_{x \rightarrow 2} f(x) = -1$   
 \_\_\_\_\_ b.  $\lim_{x \rightarrow -1^+} f(x) = 1$   
 \_\_\_\_\_ c.  $\lim_{x \rightarrow 1^+} f(x) = 1$   
 \_\_\_\_\_ d.  $\lim_{x \rightarrow 2} f(x)$  exists  
 \_\_\_\_\_ e.  $\lim_{x \rightarrow 3} f(x) = 1$   
 \_\_\_\_\_ f.  $\lim_{x \rightarrow 1} f(x)$  DNE  
 \_\_\_\_\_ g.  $\lim_{x \rightarrow 3^-} f(x) = 1$   
 \_\_\_\_\_ h.  $\lim_{x \rightarrow 0^+} f(x) = \lim_{x \rightarrow 0^-} f(x)$   
 \_\_\_\_\_ i.  $\lim_{x \rightarrow 0} f(x)$  exists  
 \_\_\_\_\_ j.  $\lim_{x \rightarrow 2} f(x) = 1$   
 \_\_\_\_\_ k.  $\lim_{x \rightarrow c} f(x)$  exists at every  $c$  on the interval  $(-1, 1)$   
 \_\_\_\_\_ l.  $\lim_{x \rightarrow c} f(x)$  exists at every  $c$  on the interval  $(1, 3)$

Based on the graph evaluate the following.

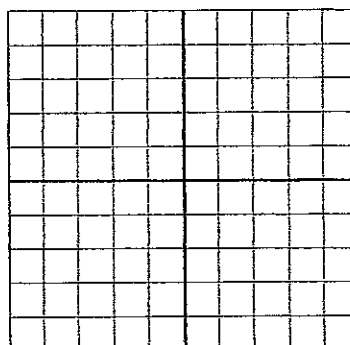
1.  $\lim_{x \rightarrow 0^-} f(x) = \underline{\hspace{2cm}}$
2.  $\lim_{x \rightarrow 0^+} f(x) = \underline{\hspace{2cm}}$
3.  $\lim_{x \rightarrow 0} f(x) = \underline{\hspace{2cm}}$
4.  $\lim_{x \rightarrow 1^-} f(x) = \underline{\hspace{2cm}}$
5.  $\lim_{x \rightarrow 1^+} f(x) = \underline{\hspace{2cm}}$
6.  $\lim_{x \rightarrow 1} f(x) = \underline{\hspace{2cm}}$
7.  $\lim_{x \rightarrow 3} f(x) = \underline{\hspace{2cm}}$
8.  $f(1) = \underline{\hspace{2cm}}$
9.  $f(0) = \underline{\hspace{2cm}}$
10.  $f(-2) = \underline{\hspace{2cm}}$
11.  $\lim_{x \rightarrow 6^-} f(x) = \underline{\hspace{2cm}}$
12.  $\lim_{x \rightarrow 6^+} f(x) = \underline{\hspace{2cm}}$
13.  $\lim_{x \rightarrow 6} f(x) = \underline{\hspace{2cm}}$
14.  $f(6) = \underline{\hspace{2cm}}$
15.  $\lim_{x \rightarrow 3} f(x) = \underline{\hspace{2cm}}$
16.  $f(3) = \underline{\hspace{2cm}}$
17.  $\lim_{x \rightarrow -1} f(x) \approx \underline{\hspace{2cm}}$
18.  $f(-1) \approx \underline{\hspace{2cm}}$
19. True or False:  $\lim_{x \rightarrow c} f(x)$  exists at every  $c$  on  $(1,3)$
20. True or False:  $\lim_{x \rightarrow c} f(x)$  exists at every  $c$  on  $(-2,1)$



43.  $\lim_{x \rightarrow 1} f(x), f(x) = \begin{cases} 1 - 2x, & x \leq 1 \\ x - 3, & x > 1 \end{cases}$   
 (a graph may help)



44.  $\lim_{x \rightarrow -1} f(x), f(x) = \begin{cases} x + 2, & x < -1 \\ x^2, & x > -1 \end{cases}$   
 (a graph may help)



In Exercises 1–8, complete the table and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result.

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

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)						

2.  $\lim_{x \rightarrow 2} \frac{x-2}{x^2-4}$

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)						

3.  $\lim_{x \rightarrow 0} \frac{\sqrt{x+3} - \sqrt{3}}{x}$

x	-0.1	-0.01	-0.001	0.001	0.01	0.1
f(x)						

4.  $\lim_{x \rightarrow -3} \frac{\sqrt{1-x} - 2}{x+3}$

x	-3.1	-3.01	-3.001	-2.999	-2.99	-2.9
f(x)						

5.  $\lim_{x \rightarrow 3} \frac{[1/(x+1)] - (1/4)}{x-3}$

x	2.9	2.99	2.999	3.001	3.01	3.1
f(x)						

In Exercises 25 and 26, sketch a graph of a function  $f$  that satisfies the given values. (There are many correct answers.)

25.  $f(0)$  is undefined.

$\lim_{x \rightarrow 0} f(x) = 4$

$f(2) = 6$

$\lim_{x \rightarrow 2} f(x) = 3$

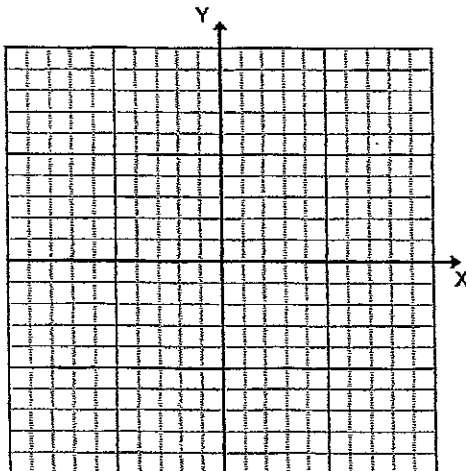
26.  $f(-2) = 0$ .

$f(2) = 0$

$\lim_{x \rightarrow -2} f(x) = 0$

$\lim_{x \rightarrow 2} f(x)$  does not exist.

#  
25



#  
26

