

1.1

Understanding Limits  
Graphically & Numerically  
Practice

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Problems 1 - 4, complete the table and use the result to estimate the limit. Graph the function and verify your result.



1.  $\lim_{x \rightarrow 2} \frac{x-2}{2x^2-9x+10}$

x	1.99	1.999	2	2.001	2.01
f(x)					

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

x	-0.01	-0.001	0	0.001	0.01
f(x)					

3.  $\lim_{x \rightarrow 4} \frac{x^2-16}{x-4}$

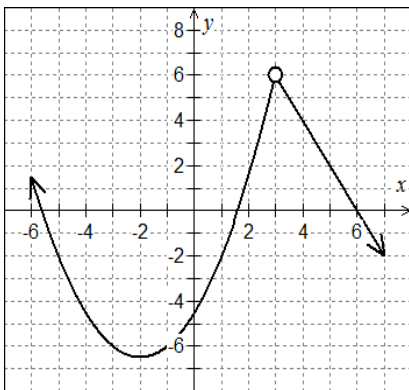
x	3.99	3.999	4	4.001	4.01
f(x)					

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

x	2.99	2.999	3	3.001	3.01
f(x)					

Problems 5 - 8, use the graph to find the limit, if it exists. If the limit does not exist, explain why.

5.



A.  $\lim_{x \rightarrow -3} f(x)$

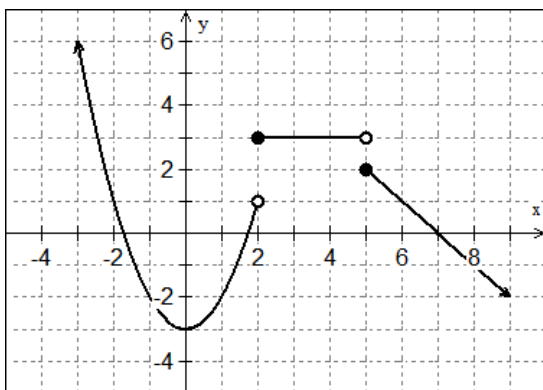
B.  $\lim_{x \rightarrow -\infty} f(x)$

C.  $\lim_{x \rightarrow 6} f(x)$

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

E. Does  $\lim_{x \rightarrow 3} f(x)$  exist? Why or why not?

6.



A.  $\lim_{x \rightarrow 0} f(x)$

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

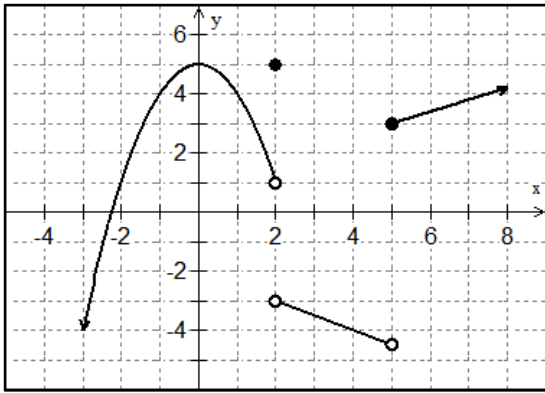
C.  $\lim_{x \rightarrow 4} f(x)$

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

E.  $\lim_{x \rightarrow -\infty} f(x)$

F.  $\lim_{x \rightarrow 7} f(x)$

7.



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

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

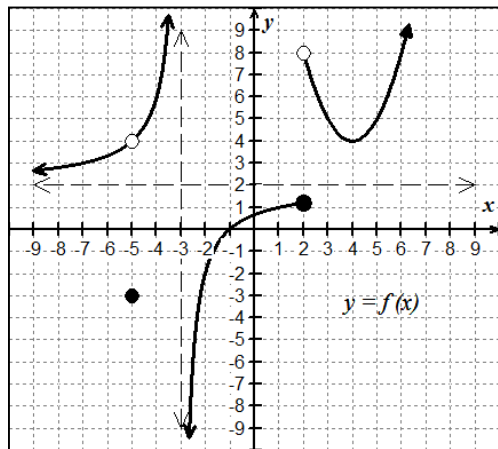
C.  $\lim_{x \rightarrow 0} f(x)$

D.  $\lim_{x \rightarrow \infty} f(x)$

E.  $\lim_{x \rightarrow 4} f(x)$

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

8.



A.  $\lim_{x \rightarrow -3^-} f(x)$

B.  $\lim_{x \rightarrow -3^+} f(x)$

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

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

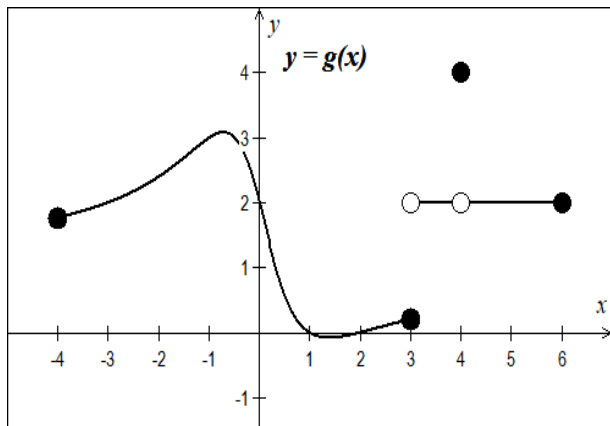
E.  $\lim_{x \rightarrow \infty} f(x)$

F.  $\lim_{x \rightarrow -\infty} f(x)$

G.  $\lim_{x \rightarrow -3} f(x)$

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

Problems 9 – 11, Use the graph of  $g(x)$  below to determine if the statements are true or false. If false, explain why.



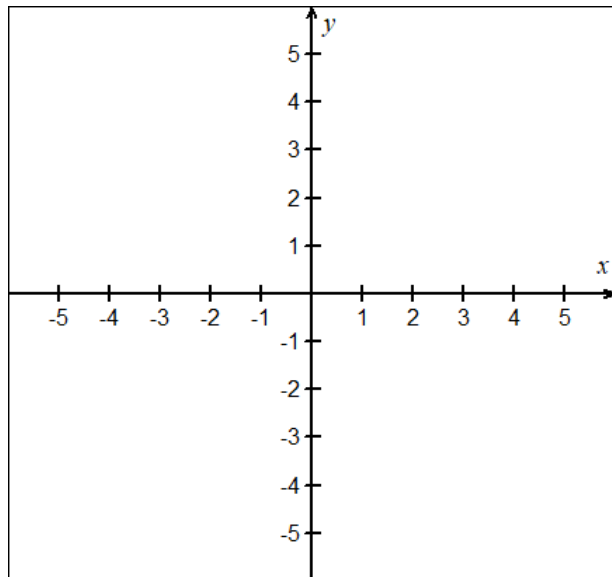
9.  $\lim_{x \rightarrow 4} g(x) = 4$

10.  $\lim_{x \rightarrow 5} g(x) = 2$

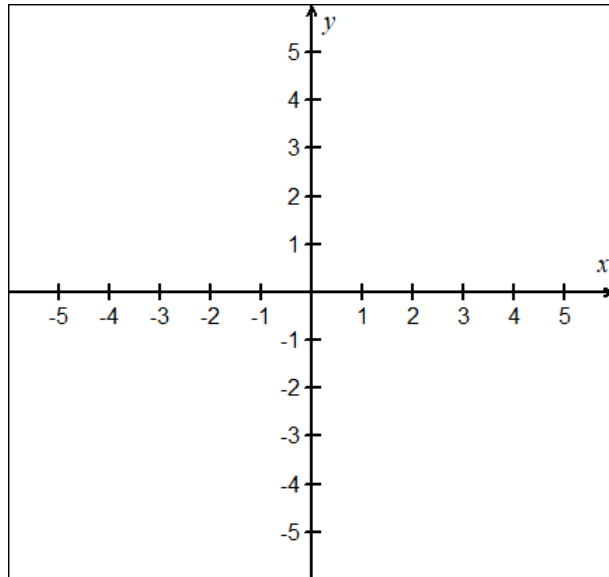
11.  $\lim_{x \rightarrow c} g(x)$  exists for every value of  $c$  in the interval  $(-4, 6)$

Problems 12 - 13, Sketch a graph of a function that satisfies each of the following conditions.

12.  $\lim_{x \rightarrow 1^-} f(x) = 2$      $\lim_{x \rightarrow 1^+} f(x) = -3$   
 $f(1) = 4$



13.  $\lim_{x \rightarrow -3^-} f(x) = 1$      $\lim_{x \rightarrow -3^+} f(x) = -4$   
 $\lim_{x \rightarrow 2^-} f(x) = \infty$      $\lim_{x \rightarrow 2^+} f(x) = -\infty$



14. Use the table below of the rational function  $y = H(x)$  to find the indicated limits. For limits that do not exist, write D.N.E.

$x$	-1000	-4.001	-4	-3.999	1.999	2	2.001	1000
$H(x)$	-0.998	0.666	undefined	0.666	-4497	undefined	4504	3.0002

A.  $\lim_{x \rightarrow -4^-} H(x) =$

B.  $\lim_{x \rightarrow -4^+} H(x) =$

C.  $\lim_{x \rightarrow -\infty} H(x) =$

D.  $\lim_{x \rightarrow -4} H(x) =$

E.  $\lim_{x \rightarrow 2^-} H(x) =$

F.  $\lim_{x \rightarrow 2^+} H(x) =$

G.  $\lim_{x \rightarrow 2} H(x) =$

H.  $\lim_{x \rightarrow \infty} H(x) =$