

Understanding the Limit Homework

Name _____

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

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

2. $\lim_{x \rightarrow 0} \frac{\sin x}{x} \approx 1$

x	1.99	1.999	2	2.001	2.01
f(x)	-0.980	-0.998	DNE	-1.002	-1.020

x	-0.01	-0.001	0	0.001	0.01
f(x)	0.999	0.999	DNE	0.999	0.99

3. $\lim_{x \rightarrow 4} \frac{x^2-16}{x-4} \approx 8$

4. $\lim_{x \rightarrow 3} \frac{\sqrt{x+1}-2}{x-3} \approx 0.25$

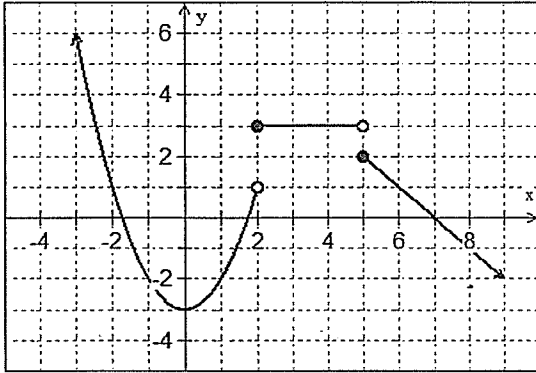
x	3.99	3.999	4	4.001	4.01
f(x)	7.99	7.999	DNE	8.001	8.01

x	2.99	2.999	3	3.001	3.01
f(x)	0.250	0.250	DNE	0.249	0.249

Problems 5 - 9, use the graph to find the limit (if it exists). If the limit does not exist, explain why.

<p>5.</p>	<p>A. $\lim_{x \rightarrow 0} f(x)$ 4</p>	<p>B. $\lim_{x \rightarrow -4} f(x)$ -3</p>
	<p>C. $\lim_{x \rightarrow -2^-} f(x)$ 1</p>	<p>D. $\lim_{x \rightarrow -2^+} f(x)$ 3</p>
	<p>E. Does $\lim_{x \rightarrow -2} f(x)$ exist? Why or why not? DNE $\lim_{x \rightarrow -2^-} f(x) \neq \lim_{x \rightarrow -2^+} f(x)$</p>	
<p>6.</p>	<p>A. $\lim_{x \rightarrow -3} f(x)$ -6</p>	<p>B. $\lim_{x \rightarrow -\infty} f(x)$ ∞</p>
	<p>C. $\lim_{x \rightarrow 6} f(x)$ 0</p>	<p>D. $\lim_{x \rightarrow 1} f(x)$ -2</p>
	<p>E. Does $\lim_{x \rightarrow 3} f(x)$ exist? Why or why not? Yes $\lim_{x \rightarrow 3^+} f(x) = \lim_{x \rightarrow 3^-} f(x) = 6$</p>	

7.



A. $\lim_{x \rightarrow 0} f(x)$
-3

B. $\lim_{x \rightarrow 2^-} f(x)$
1

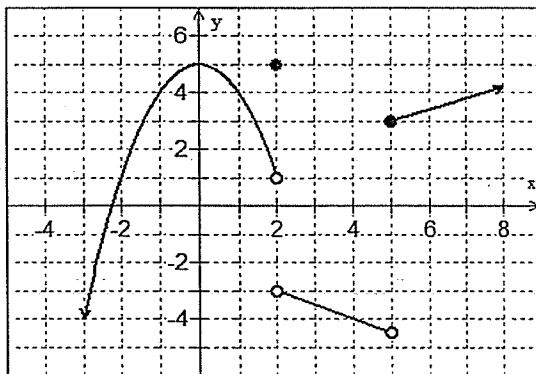
C. $\lim_{x \rightarrow 4} f(x)$
3

D. $\lim_{x \rightarrow 5} f(x)$
↓ ne
one sided limit not equal

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

F. $\lim_{x \rightarrow 7} f(x)$
0

8.



A. $\lim_{x \rightarrow 5^-} f(x)$
-4.5

B. $\lim_{x \rightarrow 2} f(x)$
↓ ne

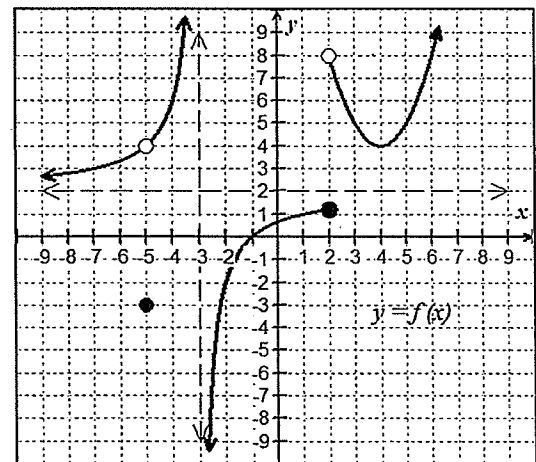
C. $\lim_{x \rightarrow 0} f(x)$
5

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

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

F. $\lim_{x \rightarrow 2^+} f(x)$
3

9.



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

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

C. $\lim_{x \rightarrow 2^-} f(x)$
1

D.) $\lim_{x \rightarrow 2^+} f(x)$
8

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

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

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

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