

Pre-Calculus
Limits at a Point – Day 2

Name:

Date:

Period:

Complete the table and use the result to estimate the limit.

1) $\lim_{x \rightarrow 2} (5x + 4)$

x	$f(x)$
1.99	
1.999	
2	
2.001	
2.01	

2) $\lim_{x \rightarrow -1} (2x^2 + x - 4)$

x	$f(x)$
-1.01	
-1.001	
-1	
-0.999	
-0.99	

3) $\lim_{x \rightarrow -3} \frac{x+3}{x^2-9}$

x	$f(x)$
-3.01	
-3.001	
-3	
-2.999	
-2.99	

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

x	$f(x)$
1.99	
1.999	
2	
2.001	
2.01	

5) $\lim_{x \rightarrow 0} \frac{\sin 2x}{x}$

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

6) $\lim_{x \rightarrow 0} \frac{\tan x}{2x}$

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

Determine whether a limit exists. If it does, find the limit. If it doesn't exist, explain why.

7) $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} 2x+1, & x < 2 \\ x+3, & x \geq 2 \end{cases}$

8) $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} -2x, & x \leq 2 \\ x^2 - 4x + 1, & x > 2 \end{cases}$

9) $\lim_{x \rightarrow 0} \frac{5}{2 + e^x}$

10) $\lim_{x \rightarrow -1} \ln(7-x)$

11) $\lim_{x \rightarrow 0} \cos \frac{1}{x}$

12) $\lim_{x \rightarrow 1} \sin \pi x$

13) $\lim_{x \rightarrow 4} \frac{\sqrt{x+3}-1}{x-4}$

14) $\lim_{x \rightarrow 2} \frac{\sqrt{x+5}-4}{x-2}$

Pre-Calculus
Limits at a Point – Day 2

Name: Answers
Date: _____ Period: _____

Complete the table and use the result to estimate the limit.

1) $\lim_{x \rightarrow 2} (5x + 4) = 14$

x	f(x)
1.99	13.95
1.999	13.995
2	14
2.001	14.005
2.01	14.05

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

x	f(x)
-1.01	-2.97
-1.001	-2.997
-1	-3
-0.999	-3.003
-0.99	-3.03

3) $\lim_{x \rightarrow -3} \frac{x+3}{x^2-9} = \frac{1}{6} \approx .16\bar{6}$

x	f(x)
-3.01	-.1664
-3.001	-.1666
-3	error
-2.999	.1667
-2.99	.1669

4) $\lim_{x \rightarrow 2} \frac{x-2}{x^2-x-2} = \frac{1}{3} \approx .333$

x	f(x)
1.99	.33445
1.999	.33344
2	error
2.001	.33322
2.01	.33223

5) $\lim_{x \rightarrow 0} \frac{\sin 2x}{x} = 2$

x	f(x)
-0.01	.03441 1.999
-0.001	.03441 2
0	error error
0.01	.03441 1.999
0.001	.03441 2

6) $\lim_{x \rightarrow 0} \frac{\tan x}{2x} = \frac{1}{2}$

x	f(x)
-0.01	.50002
-0.001	.5
0	error
0.001	.50002
0.01	.5

Determine whether a limit exists. If it does, find the limit. If it doesn't exist, explain why.

7) $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} 2x+1, & x < 2 \rightarrow 5 \\ x+3, & x \geq 2 \rightarrow 5 \end{cases} =$

$\lim_{x \rightarrow 2} f(x) = 5$

8) $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} -2x, & x \leq 2 \rightarrow -4 \\ x^2 - 4x + 1, & x > 2 \rightarrow -3 \end{cases} \neq$

$\lim_{x \rightarrow 2} f(x) = \text{DNE}$ b/c the left & right behaviors don't match.

9) $\lim_{x \rightarrow 0} \frac{5}{2+e^x} = 0$

10) $\lim_{x \rightarrow -1} \ln(7-x) = \ln(8)$

11) $\lim_{x \rightarrow 0} \cos \frac{1}{x} = \text{DNE}$
b/c oscillates between ± 1

12) $\lim_{x \rightarrow 1} \sin \pi x = 0$

$\sin(\pi \cdot 1) = \sin(\pi) = 0$

13) $\lim_{x \rightarrow 4} \frac{\sqrt{x+3}-1}{x-4} = \text{DNE}$

b/c Right & left behaviors don't match AND they go to $\pm \infty$.

14) $\lim_{x \rightarrow 2} \frac{\sqrt{x+5}-4}{x-2} = \text{DNE}$

b/c Right & left behaviors don't match AND they go to $\pm \infty$.