

Limits

1. Let $f(x) = x^3$. We wish to calculate $\lim_{x \rightarrow 3} f(x)$.

(a) Complete the following table.

x	$f(x)$
2.9	
2.99	
2.999	
2.9999	

x	$f(x)$
3.1	
3.01	
3.001	
3.0001	

(b) Based on the above tables, what do you conclude about $\lim_{x \rightarrow 3} f(x)$?

(c) What is the value of $f(3)$?

2. Let $f(x) = \sin(x)/x$. We wish to calculate $\lim_{x \rightarrow 0} f(x)$.

(a) Complete the following table. Be sure your calculator is in radians.

x	$f(x)$
0.1	
0.01	
0.001	
0.0001	
0.00001	

(b) Based on the above tables, what do you conclude about $\lim_{x \rightarrow 0} f(x)$?

(c) What is the value of $f(0)$?

3. Let $g(x) = \sin(1/x)$. We wish to calculate $\lim_{x \rightarrow 0} g(x)$.

(a) Complete the following table. Again, be certain you're using radians.

x	$g(x)$
0.1	
0.01	
0.001	
0.0001	
0.00001	
0.000001	

(b) Based on the above table, what do you conclude about $\lim_{x \rightarrow 0} g(x)$?

(c) What is the value of $g(0)$?