

## 1.2 Limits

A. Limit - a value you approach  
but may not get to

1.  $\lim_{x \rightarrow c} f(x) = L$

Annotations:  
-  $x \rightarrow c$  is circled with an arrow pointing to "Where we approach"  
-  $f(x)$  has an arrow pointing to "path"  
-  $L$  is circled with an arrow pointing to "where you are headed"

Ex.  $y = x^2$

$\lim_{x \rightarrow 3} x^2$

$x$	$f(x)$
1	1
2	4
2.5	6.25
2.9	
2.99	
2.999	

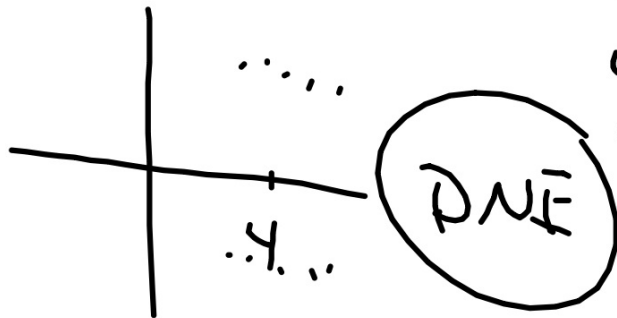
$x$	$f(x)$
5	25
4	16
3.1	
3.01	
3.001	
	9

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

$\text{DNE}$

$x$	$f(x)$
1.9	5
1.99	6
1.999	7
2.1	-1
2.01	-2
2.001	-3

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

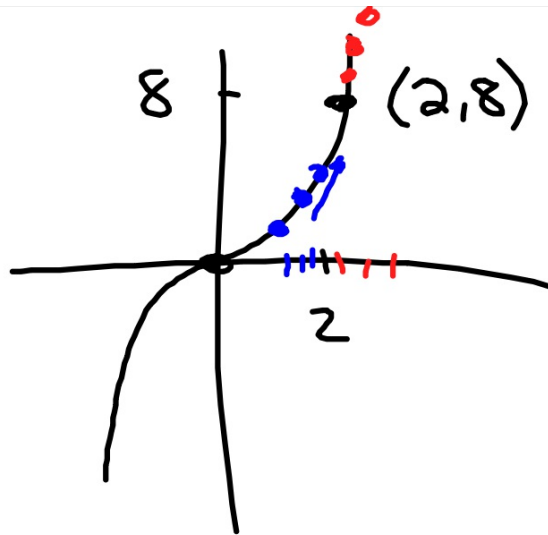


$x$	$f(x)$
3.9	+1
3.99	-1
3.999	+1
4.01	-1
4.001	+1

## B. Graphs

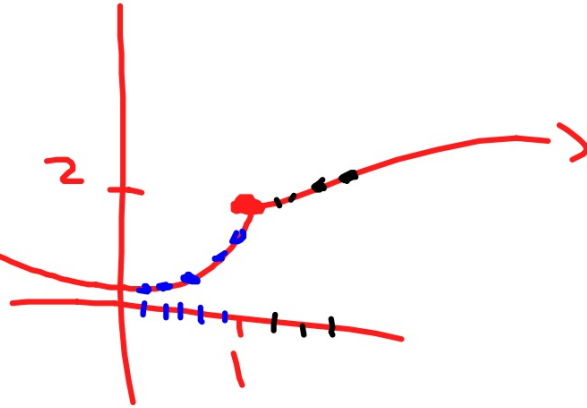
A.  $y = x^3$

$$\lim_{x \rightarrow 2} x^3 = 8$$



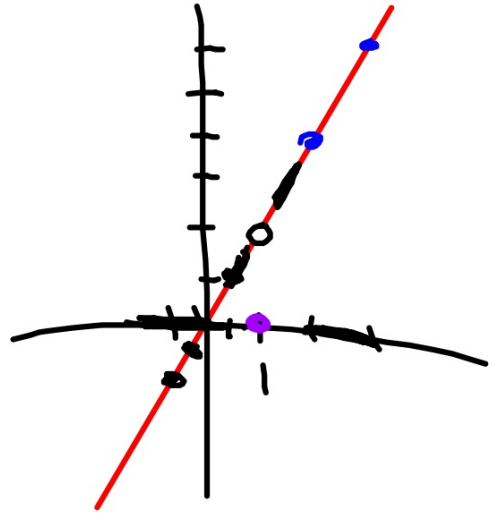
Ex.  $\lim_{x \rightarrow 1000} f(x) = 2$

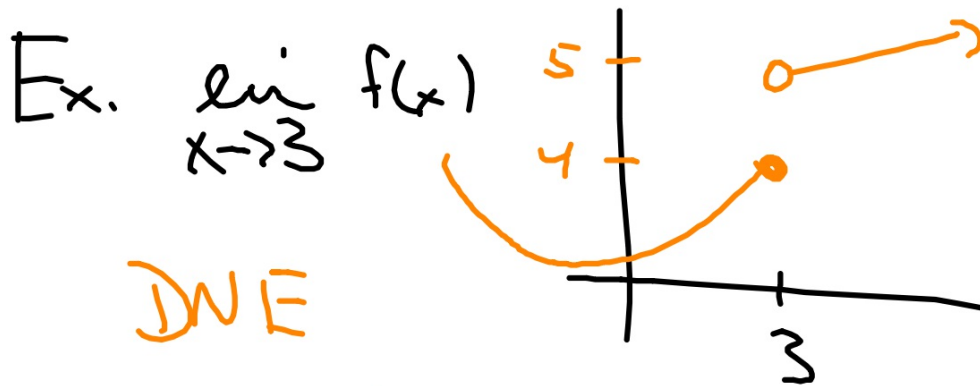
$x \rightarrow 1000$



$$\text{Ex. } \lim_{x \rightarrow 1} f(x) = 2$$

$$f(x) = \begin{cases} 2x & x \neq 1 \\ 0 & x = 1 \end{cases}$$





$$f(x) = \begin{cases} x^2 & x \leq 3 \\ 2x & x > 3 \end{cases}$$



1.2 2-8 Even  
9-12, 16, 18, 20  
23, 26