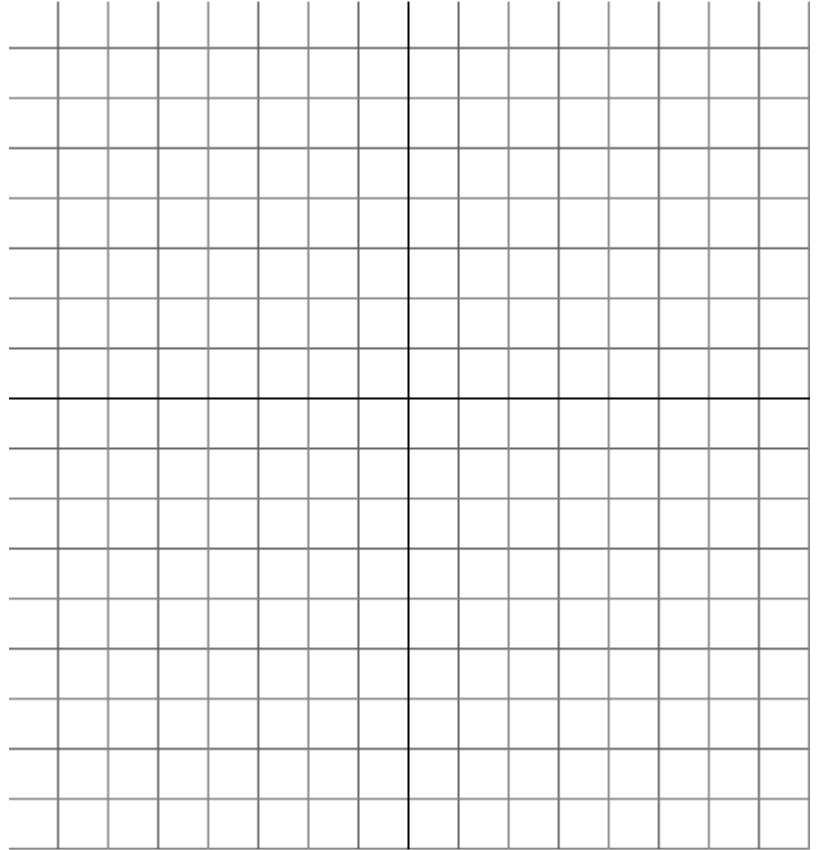


SI Session: June 10<sup>th</sup>, 2008  
Mondays – Thursdays  
12:30 PM – 2:00 PM  
Room 1229

Prof. Stockton : Calculus I  
Summer I 2008  
SI Leader : Neil Jody

[1] Find the limit  $L$ . Then find  $\delta > 0$  such that  $|f(x) - L| < 0.01$  whenever  $0 < |x - c| < \delta$ .

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



[2] Evaluate each limit.

(a)  $\lim_{x \rightarrow -2} x^3$

(b)  $\lim_{x \rightarrow 0} (2x - 1)^3$

[3] Given  $f(x) = 2x^2 - 3x + 1$  and  $g(x) = \sqrt[3]{x + 6}$ , find the following limits.

(a)  $\lim_{x \rightarrow 4} f(x)$

(b)  $\lim_{x \rightarrow 21} g(x)$

(c)  $\lim_{x \rightarrow 4} g[f(x)]$

[4] Find the following limits.

(a)  $\lim_{x \rightarrow \frac{5\pi}{3}} \cos x$

(b)  $\lim_{x \rightarrow 7} \sec\left(\frac{\pi x}{6}\right)$

[5] Find the following limits(if they exist).

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

(b)  $\lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$

$$(c) \lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x - 3}$$

$$(d) \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - x^2}{\Delta x}$$

$$(e) \lim_{x \rightarrow 0} \frac{3(1 - \cos x)}{x}$$

$$(f) \lim_{\theta \rightarrow 0} \frac{\cos \theta \tan \theta}{\theta}$$

$$(g) \lim_{x \rightarrow 0} \frac{\tan^2 x}{x}$$

$$(h) \lim_{\phi \rightarrow \pi} \phi \sec \phi$$

$$(i) \lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x}$$

$$(j) \lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 3x}$$

[6] Find the limit(if it exists). If it does not exist, explain why.

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

$$(b) \lim_{x \rightarrow 2^+} \frac{|x-2|}{x-2}$$

$$(c) \lim_{\Delta x \rightarrow 0^+} \frac{(x+\Delta x)^2 + x + \Delta x - (x^2 + x)}{\Delta x}$$

$$(d) \lim_{x \rightarrow 1^+} f(x), \text{ where } f(x) = \begin{cases} x, & x \leq 1 \\ 1-x, & x > 1 \end{cases}$$

$$(e) \lim_{x \rightarrow \frac{\pi}{2}} \sec x$$

[7] Find the  $x$ -values (if any) at which  $f$  is not continuous. Which of the discontinuities are removable?

$$(a) f(x) = \frac{x-3}{x^2-9}$$

$$(b) f(x) = \frac{x-1}{x^2+x-2}$$



$$(c) f(x) = \begin{cases} -2x + 3, & x < 1 \\ x^2, & x \geq 1 \end{cases}$$

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