Math 171 - Quiz 2

August 29, 2013

Name __key__

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Determine whether each statement is true (T) or false (F).

   (a) __F__ If $f(3) = 5$, then $\lim_{x \to 3} f(x) = 5$.

   (b) __F__ If $\lim_{t \to 0} g(t) = 9$, then $g(0) = 9$.

   (c) __F__ If f is not defined at $x = -1$, then $\lim_{x \to -1} f(x)$ does not exist.

   (d) __F__ $\lim_{x \to 0} \sqrt{x} = 0$

   (e) __T__ If $\lim_{x \to 7} f(x) = 8$, then $\lim_{x \to 7} \sqrt[3]{f(x)} = 2$.

2. (2 points) Find k if $\lim_{x \to 2} (5x^2 + kx - 2) = 8$.

$$5(2)^2 + k(2) - 2 = 8$$
$$20 + 2k - 2 = 8 \quad \Rightarrow \quad 2k = -10 \quad \Rightarrow \quad \boxed{k = -5}$$

3. (2 points) Use a table of values to estimate the following limit. Your table must show function values at six or more points.

$$\lim_{x \to 0} \frac{\tan(3x^2)}{5x^2}$$

x	$\dfrac{\tan(3x^2)}{5x^2}$
0.1	0.60018
0.01	0.600000018
0.001	0.6
-0.1	0.60018
-0.001	0.600000018
-0.001	0.6

Looks like

$$\lim_{x \to 0} \frac{\tan 3x^2}{5x^2} = 0.6$$

4. (1 point) Explain why the limit laws cannot be used to evaluate $\lim_{x \to \pi/2} [\tan(x) \cos(x)]$.

Limit laws cannot be used because tan x is not defined at x = π/2.

Nonetheless,

$$\lim_{x \to \pi/2} \tan x \cos x = \lim_{x \to \pi/2} \frac{\sin x}{\cos x} \cdot \cos x = 1$$