235 Quiz 3 Name: * key *

October 5, 2012

You have 30 minutes to complete this quiz. You may use your Notebook, provided that it contains no loose papers and everything in it was written by you personally. When you are finished you may leave or you can stay to ask questions.

1. Determine whether each of the following are True or False. (1.5, 1.6 #1, 2.3 #7)

2 each (8 pts)

(T) F If $\lim_{x\to 5} f(x) = 0^+$, then $\lim_{x\to 5} \frac{1}{f(x)} = \infty$.

T (F) If $\lim_{x\to 2} f(x) = \infty$ and $\lim_{x\to 2} g(x) = \infty$ then $\lim_{x\to 2}(f(x) - g(x)) = 0$.

T (F) The function $f(x) = \sec x$ is continuous at $x = \frac{\pi}{2}$. $\sec x = \frac{1}{\cos x}$

T (F) The derivative of $f(x) = 3^x$ is $f'(x) = x3^{x-1}$. NO!

2. The function $f(x) = 4x^3 - 5x + 1$ is both continuous and differentiable at $x = 2$. Write these two facts as limit statements. (2.2 #7)

3 each (6 pts)

cont: $\lim_{x\to 2} (4x^3 - 5x + 1) = 4(2)^3 - 5(2) + 1 \quad (= 23)$

diff: $\lim_{h\to 0} \frac{(4(2+h)^3 - 5(2+h) + 1) - (4(2)^3 - 5(2) + 1)}{h}$ exists

3. Given the graph of $f(x)$ shown on the right, list the letters for the quantities on the left in the blanks in order from least to greatest: (2.1 #16)

6 pts total

B < C < A < D

(A) the average rate of change of f on $[0, 1]$

(B) $\frac{f(-1+0.1) - f(-1)}{0.1}$

(C) $\frac{f(1) - f(-1)}{1 - (-1)}$

(D) $\lim_{h\to 0} \frac{f(1+h) - f(1)}{h}$