**Math 116 Quiz 1: $\oint$ 5.1-5.4, 6.1-6.2** **Name:** _____
**Tue 11 Sep 2012**

You have 15 minutes to complete this quiz. Eyes on your own paper and good luck!

1. **Definitions/Concepts.** (3 pts) Write down the Fundamental Theorem of Calculus.

2. **Questions/Problems.**

   (a) (2 pts) Recall that when we want to estimate area under a curve for a function $f(t)$ over the interval $t \in [a, b]$ we can use a left-hand or right-hand approximation. Let $n$ denote the number of equally-sized subdivsions we use to divde the interval $[a, b]$. Then

   $$\Delta t = \frac{b-a}{n}$$

   and we can let $t_0 = a,\ t_1 = t_0 + \Delta t,\ t_2 = t_1 + \Delta t$, etc.
   Suppose you have the data:

| t | 0 | 4 | 8 | 12 | 16 |
|---|---|---|---|---|---|
| f(t) | 25 | 23 | 22 | 20 | 17 |

Table 1: number of students awake after $t$ minutes into a boring lecture

Use this data to fill in the missing information:

| | | | | |
|---|---|---|---|---|
| $n = 4$ | | | | |
| $\Delta t =$ | | | | |
| $a =$ | $b =$ | | | |
| $t_0 =$ | $t_1 =$ | $t_2 =$ | $t_3 =$ | $t_4 =$ |
| $f(t_0) =$ | $f(t_1) =$ | $f(t_2) =$ | $f(t_3) =$ | $f(t_4) =$ |

| | | | | |
|---|---|---|---|---|
| $n = 2$ | | | | |
| $\Delta t =$ | | | | |
| $a =$ | $b =$ | | | |
| $t_0 =$ | $t_1 =$ | $t_2 =$ | | |
| $f(t_0) =$ | $f(t_1) =$ | $f(t_2) =$ | | |

**MORE QUIZ ON THE BACK –>**

(b) (3 pts each) Write out the entire word, either True or False. No justification is needed.

i. If $\int_0^2 (3f(x)+1)dx = 8$, then $\int_0^2 f(x)dx = 2$.

ii. If $f(x) = \int_{-2x}^0 (1+t^4)dt$, then $f(x)$ is decreasing.

iii. If $f(x) \leq g(x)$ for $x \in [0,1]$, then $\int_0^1 f(x)dx \leq \int_0^1 g(x)dx$.

iv. If $g(x)$ is odd and $\int_1^3 g(x)dx = 2$, then $\int_{-3}^{-1} g(x)dx = 2$.

v. If $f(t)$ is measured in dollars per year, and $t$ in measured in years, then $\int_a^b f(t)dt$ is measured in dollars per years squared.

3. **Computations/Algebra.**

*-none this week-*