Math 116 (Spring 2012) **Name:** _____
Quiz: §5.1 - 5.4, 6.1-6.2, 6.4
5/08/2011

Show all work and include units where appropriate. (25 pts)

1. Circle "True" if the statement is always true. Otherwise, circle "False." You do not need to include an explanation. (2 pts each)

   (a) On the interval $a \leq x \leq b$, the definite integral of a function $f(x)$ is the total area between the graph and the x-axis between $x = a$ and $x = b$.

   True False

   (b) For the function $f(x) = \int_0^x e^{t^3} dt$, $f'(x) = e^{x^3} \cdot 3x^2$.

   True False

2. (a) State the Fundamental Theorem of Calculus. (2 pts)

   (b) Use the fundamental theorem of calculus to determine the positive value of b if the area under the graph of $f(x) = 4x + 1$ between $x = 2$ and $x = b$ is equal to 11. (5 pts)

3. Find the derivatives of the following functions. (3 pts each)

(a) $f(x) = 3x\cos(\pi x)$

(b) $g(x) = 2x^2 e^{2x+3}$

(c) $h(x) = \dfrac{2x+7}{\sin(3x)}$

4. Consider the velocity function given by the table below.

t (s)	0	3	6	9	12
$v(t)$ (m/s)	6	8	9	11	12

(a) Approximate the distance traveled by the object by using a left sum with 4 subdivisions. (3 pts)

(b) Based on the information given, is your estimate an overestimate or underestimate? Why? (2 pts)