Math 116-101 or 102 (Circle One)
Name: $\qquad$
Quiz 2: §7.1,7.2,7.5
05/15/2012

Show all work and include units where appropriate. You have 30 minutes to complete this quiz. ( 25 pts )

1. Let $g$ be a function differentiable on $0 \leq x \leq 4$. Suppose $\int_{0}^{4} g(x) d x=10$. A table of values of $g$ and $g^{\prime}$ is given below. Compute the following integrals exactly. Show all work.

| x | 0 | 1 | 2 | 3 | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{~g}(\mathrm{x})$ | -1 | 2 | 6 | 2 | 0 |
| $\mathrm{~g}^{\prime}(\mathrm{x})$ | 2 | 3 | -1 | -3 | 1 |

(a) $\int_{0}^{4} x g^{\prime}(x) d x .(3 \mathrm{pts})$
(b) Compute $\int_{1}^{2} x g^{\prime}\left(x^{2}\right) d x$. (3 pts)
(c) Compute $\int_{3}^{4} g^{\prime}(x) g^{\prime}(g(x)) d x(3 \mathrm{pts})$
(d) $\int_{0}^{2} x^{3} g^{\prime}\left(x^{2}\right) d x(3 \mathrm{pts})$ [HINT: It may help to use your answer from part (a).]
2. Will and James are kayaking in the Gulf of Mexico. Their velocity, $v(t)$, (in $\frac{\text { miles }}{\text { hour }}$ ) is a function of how long, $t$, (in hours) they have been kayaking. $v(t)$ is given by the function $v(t)=\frac{-1}{6} t^{3}-\frac{1}{2} t^{2}+4 t$.
(a) Is $v(t)$ increasing or decreasing on the interval $0 \leq t \leq 2$ ? Justify your answer. (2 pts)
(b) Is $v(t)$ concave up or concave down on the interval $0 \leq t \leq 2$ ? Justify your answer. (2 pts)
(c) Using a left hand Riemann sum with $n=4$ subintervals, estimate the distance Will and James kayaked during those two hours. Include units. (2 pts)
(d) Using the midpoint rule with $n=4$ subintervals, estimate the distance Will and James kayaked. Include units. (3 pts)
(e) Without computing the exact distance Will and James kayaked, are your answers from parts (c) and (d) overestimates or underestimates? Justify. (4 points)

