Exam Practice

4) Let $f(x) = \sqrt{4 + x}$ and let $a = 0$.
   a) Find the tangent line to $f$ at $a$.
   b) Use the tangent line to find an approximate value for $\sqrt{3.88}$

5) Let $f(x) = (8 + x)^{\frac{1}{3}}$ and let $a = 0$.
   a) Find the tangent line to $f$ at $a$.
   b) Use the tangent line to find an approximate value for $(7.88)^{\frac{1}{3}}$

C) (35 points) Lithium is an antipsychotic drug, used to control bipolar disorder (at one time, it was an ingredient in 7Up). If Lithium is taken orally, all the dose goes into the blood. It’s administered with an initial blood concentration of 2mg/L (just below toxic) and decays exponentially; after 11hrs, the concentration would be down to 1.4mg/L. What’s the relaxation time? You can leave logs in your answer, but you must keep units throughout the problem.

B) (35 points) Calculus is finally over & you drop your calculator over the edge of the Grand Canyon. 6,400 feet below, you see it hit the ground. How fast is it going?

Remember: no memorized formulas from other classes; keep units throughout the problem (except for $g$; you can put those units in at the end).

Riemann Practice

1) Let $f(x) = (x - 1)^2$ on $[-1, 2]$.
   a) Break the interval into five equal pieces. Find $\Delta x_i$
   b) List the list the endpoints $x_i$
   c) Draw the graph of $f$ and the the rectangles for an upper sum
   d) List the $x_i^*$ for the upper sum.
   e) List the $f(x_i^*)$ and use these to find $R_5$.

2) Let $f(x) = 1 + |x|$ on $[-1, 2]$.
   a) Break the interval into five equal pieces. Find $\Delta x_i$
   b) List the list the endpoints $x_i$
   c) Draw the graph of $f$ and the the rectangles for an upper sum
   d) List the $x_i^*$ for the upper sum.
   e) List the $f(x_i^*)$ and use these to find $R_5$. 