MATH 166
SUMMER 2011
QUIZ 4

1. Suppose that I have a sphere of radius $R > 0$. I drill a hole of some smaller radius from the north pole to the south pole in such a way that the remaining "napkin ring" stands at height h.
   a) (5 pt) Find a formula for the volume of the left over "napkin ring".
   b) (5 pt) What (should) happens to your formula when $h = 0$ and when $h = 2R$?

2. (5 pt) Suppose that a 100 pound bucket is to be hoisted up a 300 foot shaft. Find the work done if the cable used to hoist the bucket weighs 5 pounds per foot.

3. (5 pt) Find the average value of the function $f(t) = \frac{2t}{t^2+4}$ on the interval $[a, x]$.