Math 116-101 or 102 (circle one) (Spring 2012) **Name:** _____
Quiz 4: §8.7-8.8, 9.1-9.3
6/05/2012

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

1. Consider the function

$$p(x) = \begin{cases} 0, & \text{if } x < 0 \\ kx^2(1-x), & \text{if } 0 \leq x \leq 1 \\ 0, & \text{if } x > 1 \end{cases}$$

   (a) For what value of k is $p(x)$ a probability density function? (3 pts)

   (b) Using that value of k, find the probability that x is greater than 0.5.(2 pts)

   (c) Find the mean.(3 pts)

   (d) Find the median.(3 pts)

2. Use the formulas for the sums of geometric series on the following. (3 pts each)

   (a) $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \cdots$

   (b) $\sum_{n=5}^{15} \left(\frac{2}{3}\right)^n$

3. Suppose that you make monthly deposits into a savings account of \$250, with the first deposit occurring today. Every month, your account pays 4% interest. Let B_n represent the balance in your account immediately after the nth deposit.

   (a) Find B_1, B_2, and B_3.(3 pts)

   (b) Find a closed form, explicit formula (that is, no summation signs or $+\cdots+$) for B_n. (5 pts)