Calc II Problem sheet

Wednesday, June 23

1. Let $p(x) = ce^{-2x^2}$.
   (a) Find a value of c so that p is a good probability distribution.
   (b) Find the mean and standard deviation of p.
2. Suppose that exam scores are normally distributed with a mean of 75 and a standard deviation of 10.
   (a) Let X denote the score of a randomly chosen exam. Express
   $$P(70 < X < 80)$$
   as a normal integral.
   (b) Translate your normal integral above to a standard normal integral.
3. I have a 12 sided die with
   - six sides labeled 1,
   - three sides labeled 2, and
   - three sides labeled 4.

   (a) Write down a computation showing that the expected value of one roll of this die is 2.
   (b) Write down a computation showing that variance associated with one roll of this die is 3/2. What's the corresponding standard deviation?
   (c) Suppose I roll the die 100 times add the rolls together and call the result S.
      i. What is the expected value of S?
      ii. What is the standard deviation of S?
      iii. Write down a normal integral representing $P(195 < S < 210)$.