MATH 210, PROBLEM SET 5

1. (30 points) Go to the Pennsylvania State Lottery web site,

    http://www.palottery.state.pa.us/games.aspx?id=430

   and click on the "Games" link on the left side of the screen. Follow the link to the "Daily Number" game. Then click on "Click here to view Prizes and Odds" below the description of how to play. Calculate the odds of winning each of the different variations of the "Daily Number" game. Then using the payouts listed, calculate the expected return from each of the variations of the "Daily Number" game for an investment of $1.

2. (30 points) Suppose that 30,000 people play the simplest version of the "Daily Numbers" game on a given day. In this variation, the only way to win is to guess the three digits correctly in the correct order. What is the probability that the state of Pennsylvania exactly breaks even? Write this down using binomial coefficients, and then get a numerical answer either using Wolfram alpha or the "Binomial" and "evalf" commands of Maple.

Extra Credit (due anytime during the semester)

3. In problem #2 above, replace "exactly breaks even" by "loses".