Homework 5

Do the problems on webwork and turn the following problems in class on Oct. 8st.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

Problem 1. Let X be a random variable with Moment Generating Function

$$m_X(t) = K(1/4 + (1/4)^t)^6$$

for some constant K.
 (a) What value must K equal?

 (b) What is $\mathbb{E}[X]$?

Problem 2. You are dealt one card from a full deck of 52 cards and your opponent is dealt two cards (without replacement). If you get a card between 6 and 10 (inclusively) your opponent pays you 4, if you get a King or Queen or Jack your opponent pays you 3. If you don't have a 6-10, King or Queen or Jack, but you have more hearts or diamonds than your opponent, they pay you 1. In all other cases you pay 3. What is the expectation of your winning? (you paying would be a negative winnings)