Recursive Formulas II

1) Tom, for his retirement, started an annuity with payments of $150 every quarter. The interest rate is 6.8\% compounded quarterly.
   a) What would the balance be after 20 years?
   b) After seeing this number, Tom felt that this amount of money was not going to be enough for his retirement, so he decides to initially deposit $3,000 into the annuity and then contributes $150 every quarter for the next 20 years. How much is in the account after the 20 years? How much interest was earned during the 12th year of the annuity?
   c) After 20 years, Tom no longer makes deposits but his account is still earning the same amount of interest. How much is in the account after 5 more years?

2) Kathy and David wanted to start saving for their son's, Eli, college fund. They decide they would like to have saved $15,000 in 16 years. The interest rate is 7.6\% compounded quarterly.
   a) What is their payment? How much is in Eli's college fund after 10 years?
   b) Eli's godfather decided he would help too. But he wanted to make a lump sum deposit that would grow to $15,000 at 7.6\% interest compounded quarterly. What is his payment? How much is in the fund after 10 years?

3) Janet and Jeff bought a house for $220,000. Their down-payment was 10\% of the purchase price. Their mortgage is for 30 years at 6.18\% interest compounded monthly.
   a) Find their monthly payment.
   b) How much interest is paid during the 10th year of the mortgage?
   c) After 15 years of making payments, Janet and Jeff decide to add an additional $100 to their monthly payment. They did this for the next 5 years, so what is their balance at the end of the five years?
   d) Again Janet and Jeff decide to add an additional $50 to their previous monthly payment. So after 2 more years of doing this what is the balance now? How much equity do they now have in their house?
   e) Janet and Jeff continue to make the same payment. What is the amount of the last payment? How many payments, from the beginning, were necessary until the balance is $0?