***MAP4C - Investment and Debt Questions***

1. Suppose you have a mortgage of $150 000, and your interest rate is 4%.   
   a) How much total interest will you pay if you make monthly payments of $1000?  
   b) How much total interest will you pay if you make monthly payments of $2000?  
   c) How much more total interest will be paid in part a) compared to part b)  
   d) How many times more interest will you pay in part a) as compared to b)?
2. Suppose you save $100 every month, and your investment increases by an average of 5% per year.   
   a) If you do this for 10 years, what percentage of your money will be from interest?  
   b) If you do this for 20 years, what percentage of your money will be from interest?  
   c) If you do this for 30 years, what percentage of your money will be from interest?  
   d) What can you conclude from parts a), b) and c) above?
3. Let’s say you want to have $500 000 when you turn 60 years old, and your investments earn an average of 6% per year.  
   a) How much must you save every month to achieve your goal, if you start saving at age 20?  
   b) How much must you save every month to achieve your goal, if you start saving at age 35?  
   c) How much must you save every month to achieve your goal, if you start saving at age 50?  
   d) What can you conclude from parts a), b) and c) about the ideal time to start saving?
4. Suppose you have a mortgage of $200 000, and your interest rate is 4%.   
   a) How much must your monthly payment be in order to pay it back in 15 years (ie. 180 payments)?  
   b) How much total interest do you pay in part a)?  
   c) How much must your monthly payment be in order to pay it back in 25 years (ie. 300 payments)?  
   d) How much total interest do you pay in part c)?  
   e) How many times more interest do you pay in c) as compared to a)?  
   f) What can you conclude from parts a-e about the length of mortgages?
5. Suppose you save $250 every month for 10 years, and your investment grows by and average of 5% per year. a) Which is better for you: doubling the amount you save every month, or doubling the interest rate you receive?  
   b) what about after 30 years?
6. Your mortgage is $180 000, your interest rate is 4% per year, and your monthly payment is $1500.   
   a) In the 1st month, what percentage of your $1500 is paying back interest?  
   b) In the 75th month, what percentage of your $1500 is paying back interest?  
   c) In the final month, what percentage of your $1500 is paying back interest?  
   d) What can you conclude from parts a), b) and c) above about the amount of interest being paid over time?  
     
   ***ANSWERS*** 1a) $58290.88 b) $22897.59 c) $35393.29 d) TBD   
   2a) 22.7% b) 41.6% c) 56.7%  
   3a) About $251-252 per month b) $721-$722 per month c) $3051-$3052 per month  
   4a) about $1480 b) about $66246.40 c) about $1055-$1056 d) about $116632.23  
   e) about 1.76 times as much interest (or about $50385.83 more)  
   5. By itself: you have $38820.57. Doubling amount to $500 gives $77641.14. Doubling interest rate gives $51211.24. So doubling amount is better.  
   6. a) 40% b) 23.2% c) 0.5%