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

1. You have a mortgage of $250 000 and pay back $1500 every month. The interest rate is 4%.   
   a) How long does it take you to pay it back? b) How much total interest do you pay?  
   c) How much is your final payment? d) How much, in total, did you pay for the house?
2. You start saving $150 every month, and your investment earns 5% per year.  
   a) How much will you have after 15 years?   
   b) How much in total did you contribute?  
   c) How much total interest did you earn?  
   d) What percent of your final balance is interest?
3. 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 interest will you pay if your payment is $1000 than if it is $2000?  
   d) How many times more interest will you pay in part a) as compared to b)?  
   \*\*\*\*e) What can you conclude about the effect of doubling your payment?
4. 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?
5. 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) above?
6. 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 above?
7. 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?  
   \*\*\*\*c) Try to explain your findings from a) and b)
8. 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?  
     
   ***ANSWERS*** 1
9. a) (244 months)  
   b)($115 527)  
   c) ($1027)  
   d) ($365527)  
   2. a)($40093.34)  
   b) ($27000)  
   c) ($13093.34)  
   d) (32.7%)  
   3a) $58290.88 b) $22897.59 c) $35393.29 d) 2.54x   
   4a) 22.7% b) 41.6% c) 56.7%  
   5a) About $251-252 per month b) $721-$722 per month c) $3051-$3052 per month  
   6a) 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)  
   7. By itself: you have $38820.57. Doubling amount to $500 gives $77641.14. Doubling interest rate gives $51211.24. So doubling amount is better.  
   8. a) 40% b) 23.2% c) 0.5%