This test is worth 200 points. There are eight problems, and each problem is worth a total of 25 points. You should clearly show all of your work and justify your answers where appropriate.

1. A Volvo S60 currently costs $37,500. This cost is rising at a rate of 3.0% per year. How much would you need to invest today in an account paying 6.2% compounded annually in order to have the value of the account reach the total cost of the S60 in 4 years? Round your answer to the nearest dollar.

2. In 1991, the NBA salary cap was $14.0 million; in 2013, the salary cap was $58.04 million.

   (a) Given that consumer price index for 1991 was 134.6 and the consumer price index for 2013 was 230.2, what would be the 1991 NBA salary cap adjusted for inflation in 2013 dollars? Round your answer to the nearest million dollars.

   (b) Has the NBA salary cap grown faster or slower than overall inflation? Briefly explain your answer.

3. Two competing banks want you to invest your money in their new five year certificate of deposit (CD). Capulet Bank is offering a CD with an annual interest rate of 5.71% compounded quarterly. Meanwhile, Montague Bank is offering a CD with an annual interest rate of 5.68% compounded daily (this is assuming a 365 day year).

   (a) What APY will you earn on your investment if you choose the CD from Capulet Bank? Round your answer to the nearest hundredth of a percent.

   (b) What APY will you earn on your investment if you choose the CD from Montague Bank? Round your answer to the nearest hundredth of a percent.

   (c) Which bank offers you a better deal on your investment? Why?

4. In the the fall semester of 1992, the cost of tuition at the University of Louisville for in-state undergraduates was $1,085 per semester. In the fall semester of 2012, it cost $4,733 per semester.

   (a) What annual rate of growth does this change represent?

   (b) What is the percent change in the cost of tuition from the fall 1992 to fall 2012?

5. Cheri's aunt loans her $2000 for 5 months, but she must pay $2200 at the end of that time.

   (a) What annual simple interest rate is she being charged?

   (b) Now suppose that the amount borrowed and the simple interest rate remains the same as what you calculated in part (a), but she pays it back in 10 months instead of 5 months. What is the total amount that Cheri will pay back at the end of the 10 month period?

6. Jenny wants to accumulate $7,500 six years and nine months from now by purchasing a certificate of deposit at her bank.

   (a) How much should she pay for the CD now if the bank's CDs pay interest at the rate of 4.35% compounded monthly? Round your answer to the nearest dollar.

   (b) How much interest will she have earned?

7. Suppose that Juanita invests \$9,750 on her son's fifth birthday at 4% compounded annually.

   (a) What is the minimum number of years that this principal must be invested to grow to at least \$15,000?
   Hint: $t = \dfrac{\left(\log \frac{F}{P}\right)}{\log(1+r)}$

   (b) At the end of this time, what will the actual value of her investment be? Round your answer to the nearest dollar.

8. Three years and five months ago, Carl invested $5,000 in a savings account that earns interest at the rate of 3.72% compounded monthly. Now, he has found a new savings account that pays 4.00% compounded quarterly, and has decided to move his entire investment to that account.

   (a) How much money does Carl have right now (before he moves the money to the new account)? Round your answer to the nearest dollar.

   (b) If Carl moves the money to the new account and leaves it in there for four years and nine months, how much money will his investment be worth? Round your answer to the nearest dollar.

   (c) How much interest has Carl earned from the time that he invested the initial $5,000 in the first account and the time that he withdraws the investment from the second account?