Homework #1 (Due before start of lecture 2)

1. The price of a three-year zero-coupon government bond is $85.16. The price of a similar four-year bond is $79.81. What is the one-year implied forward rate from year 3 to year 4?
   Relevant Equation: $B_3 = B_4(1 + F_{3,4})$

2. Put-call Parity: $c + Ke^{-r\tau} = se^{-y\tau} + p$

   Jeff is an arbitrage trader, who wants to calculate the implied dividend yield on a stock while looking at the over-the-counter price of a five-year European put and call on the stock. He has the following data: s = $85, K = 90, r = 5%, c = $10, and p = $15. What is the continuous implied dividend yield of the stock (y in the above equation)?

3. Asset Returns
   Suppose that an asset has a simple return of 5% for year 1, 10% for year 2, -5% for year 3, 0% for year 4, and -10% for year 5. Calculate the corresponding continuously compounded (log) returns, and display your results in a table of three columns (time, simple returns, log returns).
   Relevant Equation: $r = log(1 + R)$, where r = log return and R = simple return.

4. Forward Rates
   Relevant Equation: $R_{F,i} = \frac{R_i T_i - R_{i-1} T_{i-1}}{T_i - T_{i-1}}$ for i = 2,3,4,5

   Suppose that zero interest rates with continuous compounding are as follows:

Maturity (years)	*Rate (% per annum)*
1	2.0
2	3.0
3	3.7
4	4.2
5	4.5

   Calculate forward interest rates for the second, third, fourth, and fifth years.

   Display your results as a table with two columns: time and forward rate.

Note: Put all your answers (outputs) and MATLAB code in one Word file and post to Blackboard.

Formatting note: Use 'format short g' to display both integers and other numbers nicely in a single table