1. You are given the following term structure:

\[ s_0(1) = 0.15, \quad s_0(2) = 0.10, \quad s_0(3) = 0.05, \]

These are effective annual rates of interest for zero coupon bonds of 1, 2, and 3 years maturity, respectively. A newly issued 3-year bond with face amount 100 has annual coupon rate 10%, with coupons paid once per year starting one year from now.

Find the price and effective annual yield to maturity of the bond.

2. A 6-month T-Bill of face amount 100 can be bought today for 97.800, and a 1-year T-Bill of face amount 100 can be bought today for 95.400. Find the forward rate of interest for the 6-month period beginning 6 months from today, quoted as a nominal annual rate of interest compounded semi-annually.

3. Suppose that yield rates on zero coupon bonds are currently 6% for a one-year maturity and 7% for a two-year maturity (effective annual rates).

Suppose that someone is willing to lend money to you starting one year from now to be repaid two years from now at an effective annual interest rate of 7%. Construct a transaction in which an arbitrage gain can be obtained (positive net gain for net investment).