1. The current exchange rate between the U.S. Dollar (USD) and the
Great Britain Pound (GPB) is 1.5641, that is, it costs $1.5641 to buy
one Pound. Take the Fed Funds rate, (technically the bank-to-bank
overnight lending rate), in the United States to be approximately 0.20%
(assume it is compounded continuously). The corresponding bank-to-
bank lending rate in Great Britain is the LIBOR and it currently is
approximately 0.26% (assume it is compounded continuously). What
is the forward rate (the exchange rate in a forward contract that allows
you to buy Pounds in a year) for purchasing Pounds 1 year from today.
What principle allows you to claim that value?

2. According to the article “Bullion bulls” on page 81 in the October 8,
2009 issue of The Economist, gold has risen from about $510 per ounce
in January 2006 to about $1050 per ounce in October 2009, 46 months
later. In September 2010 it is about $1300.

(a) What is the continuously compounded annual rate of increase of
the price of gold over the period January 2006 to October 2009?

(b) What is the continuously compounded annual rate of increase of
the price of gold over the period October 2009 to September 2010?

(c) In October 2009, one can borrow or lend money at 5% interest,
again assume it compounded continuously. In view of this, de-
scribe a strategy that will make a profit in October 2010, involving
borrowing or lending money, assuming that the rate of increase in the price gold stays constant over this time.

(d) The article suggests that the rate of increase for gold will stay constant. Did it? In view of this, what do you expect to happen to interest rates and what principle allows you to conclude that? Did they?

3. Suppose that there is a 20% decrease in the default rate from 5% to 4%. By what factor do the default rates of the 10-tranches and the derived 10th CDO change?

4. For the tranches create a table of probabilities of default for tranches \( i = 5 \) to \( i = 15 \) for probabilities of default \( p = 0.03, 0.04, 0.05, 0.06 \) and 0.07 and determine where the tranches become safer investments than the individual mortgages on which they are based.

5. For a base mortgage default rate of 5%, draw the graph of the default rate of the tranches as a function of the tranche number.