1. Why is the assumption that assets returns are normally distributed so useful when calculating VaR?

2. What is ‘backtesting’ in the VaR methodology?

3. What is the “pre-commitment approach” when applied to the regulation of financial intermediaries subject to market risk?

You can easily set up most of the following answers in the form $\text{VaR} = (ZCZ')^{1/2}$ using Excel or many other software packages (e.g. Gauss, RATS, Mathematica)

4. A zero-coupon bond will pay £1,000 in 2 years' time. You have the following information:
   (a.) current yield $y = 8.25\% \text{p.a.}$
   (b.) standard deviation of change in yield $\sigma_y = 1.009\% \text{p.d.}$
   (i.) Calculate the market value of the zero.
   (ii.) Calculate VaR for this asset using $\sigma_dP/P = n \sigma_y$ where $n = \text{maturity of the cash flow} (= \text{duration})$
   (iii.) Calculate the 10-day and 25-day VaR for this asset.

5. You have a portfolio consisting £10,000 in each of 3 assets, 1, 2 and 3. You have calculated the daily standard deviations to be 5.418%, 3.0424%, 3.6363%. The correlation between returns on assets 1 and 2 is 0.962, between assets 1 and 3 is 0.403, and between assets 2 and 3 is 0.610.
   (a.) What is the VaR for this portfolio?
   (b.) What would VaR be if returns on all assets were perfectly positively correlated?

6. What is your DOLLAR VaR when holding a UK portfolio of £100m, if the current USD-GBP exchange rate is 1.5 $/£, the correlation between the return on the UK portfolio and the $/£ exchange rate is $\rho = 0.5$. The return on the FT All-Share index has a standard deviation of 1.896% p.d. and $\sigma_{FX} = 3\% \text{p.d.}$
You are a US resident with DM 100m (DM = Deutchemarks) in the DAX-index and $100m face value in a US zero-coupon bond which matures in one year. The current spot rate is 0.6 ($ per DM) and the one year US spot interest rate is $r = 3\%$ p.a. The daily standard deviations are $\sigma_s = 3\%$, $\sigma_{DAX} = 2\%$ and $\sigma_B = 0.5\%$, where $\sigma_B$ = standard deviation of the bond price, $\sigma_s$ = standard deviation of the dollar-DM exchange rate. The correlation coefficients are $\rho_{S,DAX} = -0.5$, $\rho_{S,B} = 0$, $\rho_{B,DAX} = 0.2$. Indicate how you might calculate the daily value at risk of your portfolio? (using the 5% left tail cut off point).