Homework of Reviewing

1. You are asked to forecast the future return of the stock A. In the past three years, the price change of the stock has been 20%, -2% and 18%. The dividend yield D1/S is expected to be 4%. The rate of dividend growth, g, from past five years has been 2% per year. This is expected to remain the same in the future. The risk free rate, Rf, is 3%. The expected market return, Rm, is 12%. The beta of the stock A is 1.4. Please estimate the future return of the stock based on a) The past return data, b) CAPM model, in which the expected return of a stock is Rf + beta\*(Rm-Rf), c) Dividend yield plus dividend growth D1/S + g. Which method is likely to provide more accurate estimation? Explain your answers.
2. The security market is comprised of two risky assets X, Y with return, standard deviation of (9%, 10%) and (13%, 20%) respectively. The market capitalizations of X and Y are 45 and 55 respectively. Suppose the correlation of the two assets are 1, 0 or -1. Please calculate the values of return and standard deviation of the market portfolio in each of the three conditions. Please calculate the value of risk free rate when the correlation of X and Y are 1 and -1. When the correlation of X and Y is zero, is the risk free rate uniquely determined or not? Please explain.
3. Suppose the risk free rate is 3%, the expected rate of return and standard distribution of a risky asset are 6% and 15%. Suppose the utility function of an investor is U = E(r) – 1/2$Aσ^{2}$ , where r is the expected rate of return and σ is the standard deviation. Please calculate the investor’s asset allocation ratios between risk free asset and the risky asset, when A is equal to 1, 2 or 3 respectively.
4. A portfolio has 60% probability to gain 50% per year and 40% probability to lose 40% per year. Please calculate the arithmetic rate of return and geometric rate of return of the portfolio. The initial value of the portfolio is 1 million dollar. After ten years, what is the most likely value of this portfolio?