

Brief Answer key to questions that require computations in Midterm 1. For short answer questions, please refer to notes.

Question 2

- a) $w = 0.714$ meaning that 71.4% is invested in the risk-free asset, standard deviation of returns is 14.28%.
- b) $A = 2.45$. If an investor is risk averse, his/her utility declines with risk whereas a risk loving investor has utility function that increases with risk.
- c) Sharpe ratio is 0.35. The slope of the CAL is the Sharpe ratio which measures the excess return being earned per unit of volatility.
- d) Draw the CAL and indifference curve where they are tangent at Portfolio A. The intercept denotes the risk free asset and the S&P 500 lies to the right of Portfolio A where $y=1$. Here, since 71.4% is invested in the risky portfolio the investor is not relatively risk averse.
- e) Yes, since its correlation is less than 1 so there are diversification benefits to be had.
- f) Expected return is 10% while the standard deviation of the risky portfolio is 17.09%, where the standard deviation of the complete portfolio becomes 12.2% which is lower than portfolio A. Therefore we are now better off since we can achieve the same return with lower risk.
- g) No. The global minimum variance portfolio invests 69.23 percent in the S&P500 fund.

Question 3

- a) The expected return on the tangency portfolio is 12%. If beta is zero, the return is equal to the risk free asset which is 5%, which does not mean there is no risk, it is just that systematic risk is zero.
- b) The expected return according to the SML is 1.5% but the actual return is 10%. Since the actual expected return exceeds the fair return, the stock is underpriced and you should consider buying the stock.
- c) Only systematic risk is priced since unsystematic risk can be diversified away.