1. Assume the following exchange rates are valid:

   1 US Dollar $= 0.68$ British Pound
   1 US Dollar $= 1.22$ Canadian Dollars
   1 US Dollar $= 1.50$ Australian Dollars
   1 British Pound $= 1.09$ Euros

   (a) What is the cost in US Dollars of one British Pound?
   (b) What is the cost in British Pounds of one Canadian Dollar?
   (c) What is the cost in Euros of one Australian Dollar?

2. Stock of the XYZ company is currently trading at the price of $S = 40.00$ per share. European call options on the stock with $T = .5$ years and $K = 45.00$ are tracing at the current price of $C_0 = 0.40$ per option. At $t = 0$ an investor purchases 500 of the call options described above and takes a short position on a forward contract for delivery of 500 shares of stock at the delivery date $T = .5$ and the forward price of $F = 41.00$ per share. Assume that the investor does not make any trades between $t = 0$ and $t = .5$.

   (a) What is the initial capital $X_0$ of this strategy?
   (b) Find the value of the investor’s portfolio at $t = .5$ (i.e., find $X_{.5}$) if $S_{.5} = 25.00$.
   (c) Find the value of the investor’s portfolio at $t = .5$ (i.e., find $X_{.5}$) if $S_{.5} = 48.00$.

3. Stock of the QRS company is selling today at the price $S_0 = 50$ per share. European put options on the stock with exercise date $T = 1$ and strike price $K = 50$ are selling today at the price $P_0 = 4$ per option. An investor with no initial capital believes that the stock price is going to drop, so she constructs a portfolio by selling short 400 shares of stock and using all of the proceeds of the short sale to purchase options of the type described above. She makes no transactions between $t = 0$ and $t = 1$. Find the value of her portfolio at $t = 1$ (i.e. find $X_1$) if

   (a) $S_1 = 25$.
   (b) $S_1 = 75$.

4. Consider a stock $S$ whose initial price is $S_0 = 55$. A call option with expiration date $T$ and strike price $50$ has initial price $7.50$, and a put option with expiration date $T$ and strike price $60$ has initial price $4$. You create a portfolio $X$ by selling short 100 shares of $S$ and using the proceeds to by 500 of the call options described above, and a number of the put options described above in order to make the initial value $X_0$ of your portfolio equal to zero.
(a) How many of the put options do you buy?

(b) Plot the value $X_T$ of the portfolio at time $T$ as a function of the stock price $S_T$ at that time. In other words, draw a graph with $S_T$ on the horizontal axis and $X_T$ on the vertical axis. [Hint: consider separately the cases $S_T < 50$, $50 < S_T < 60$ and $S_T > 60$.

(c) For what values of $S_T$ is the value of the portfolio equal to zero at time $T$? For what values of $S_T$ is the value of the portfolio positive at time $T$? For what values of $S_T$ is the value of the portfolio negative at time $T$?