1. **Exercise 1.1** Let $T > 0$ be given. Let $C$ denote a call option (on a stock $S$) with exercise date $T$ and strike price $K_c = 50$. Let $P$ denote a European put option on the same stock with exercise date $T$ and strike price $K_p = 47.50$. Let $S_T$ denote the price per share of the stock at time $T$ and let $C_T$ and $P_T$ denote the value per share of the call and put options (respectively) at time $T$.

Find $C_T$ and $P_T$

(a) if $S_T = 53.47$.
(b) if $S_T = 48.52$.
(c) if $S_T = 42.71$.

2. Shares of stock of the QRS Company may be bought or sold today for $S^1_0 = 20$. A put option on this stock with expiration date $T = 1$ and strike price $K^1 = 10$ may be bought or sold for $P^1_0 = 5$.

Shares of stock of the XYZ company may be bought or sold today for $S^2_0 = 10$. A call option on this stock with expiration date $T = 1$ and strike price $K^2 = 12$ may be bought or sold for $C^2_0 = 3$.

An investor decides to buy 10 shares of QRS, 5 of the put options on QRS, 20 shares of XYZ and 10 of the call options on XYZ.

(a) What is the value of the investor’s portfolio at time $t = 0$?
(b) What is the value $P^1_1$ of one of the put options at time $t = 1$ if $S^1_1 = 27$? If $S^1_1 = 7$?
(c) What is the value $C^2_1$ of one of the call options at time $t = 1$ if $S^2_1 = 14$? If $S^2_1 = 4$?
(d) What is the value of the investor’s portfolio at time $t = 1$ if $S^1_1 = 27$ and $S^2_1 = 14$? If $S^1_1 = 7$ and $S^2_1 = 4$?