Exercise 2.36. In Example 2.2, show that $0 \leq H_1 \leq 1$.

Exercise 2.37. Prove the identities (2.17), (2.18), (2.26), (2.27), and (2.28) in Section 2.2.

Exercise 2.43. Suppose IBM pays a dividend $D$ on their shares $S$ at time $\tau$. Show that $S(\tau^+) = S(\tau^-) - D$.

Exercise 2.44. Let $C_i$ for $i = 1, 2, 3$ be European call options all expiring at $T$ with strike prices $K_i$ for $i = 1, 2, 3$, all written on the same stock $S$. The butterfly spread is the combination $C_1 - 2C_2 + C_3$ with $K_2 = \frac{1}{2}(K_1 + K_3)$. Graph $C(T)$ against $S(T)$. Show that $C_2(0) < \frac{1}{2}(C_1(0) + C_3(0))$. Discuss which assumptions you make.

Exercise 2.45. With the choices $S(0) = 10.50$, $K = 10.00$, $C(0) = 3.00$, $P(0) = 1.00$, and $R = 1.0043$, show that the call-put parity formula is violated. Show how to create an arbitrage opportunity of at least $1000$. 