1 . The common stock of Sophia Enterprises serves as the underlying asset for the following

derivative securities: (1) forward contracts, (2) European-style call options, and (3) European-

style put options.

a. Assuming that all Sophia derivatives expire at the same date in the future, complete a

table similar to the following for each of the following contract positions:

(1) A long position in a forward with a contract price of $50

(2) A long position in a call option with an exercise price of $50 and a front-end pre-

mium expense of $5.20

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Expiration Date | Sophia Stock price  Expiration Date | Derivative Payoff  Initial | Derivative Premium Net Profit |
| 25 |  |  |  |  |
| 30 |  |  |  |  |
| 35 |  |  |  |  |
| 40 |  |  |  |  |
| 45 |  |  |  |  |
| 50 |  |  |  |  |
| 55 |  |  |  |  |
| 60 |  |  |  |  |
| 65 |  |  |  |  |
| 70 |  |  |  |  |
| 75 |  |  |  |  |

(3) A short position in a call option with an exercise price of $50 and a front-end

premium receipt of $5.20

In calculating net profit, ignore the time differential between the initial derivative expense or receipt and the terminal payoff.

b. Graph the net profit for each of the three derivative positions, using net profit on the

vertical axis and Sophia’s expiration date stock price on the horizontal axis. Label the

breakeven (i.e., zero profit) point(s) on each graph.

c. Briefly describe the belief about the expiration date price of Sophia stock that an investor using each of these three positions implicitly holds.

2. Refer once again to the derivative securities using Sophia common stock as an underlying

Asset discussed in Problem 1.

a. Assuming that all Sophia derivatives expire at the same date in the future, complete a

Table similar to the following for each of the following contract positions:

(1) A short position in a forward with a contract price of $50

(2) A long position in a put option with an exercise price of $50 and a front-end premium expense of $3.23

(3) A short position in a put option with an exercise price of $50 and a front-end premium receipt of $3.23

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Expiration Date | Sophia Stock price  Expiration Date | Derivative Payoff  Initial | Derivative Premium Net Profit |
| 25 |  |  |  |  |
| 30 |  |  |  |  |
| 35 |  |  |  |  |
| 40 |  |  |  |  |
| 45 |  |  |  |  |
| 50 |  |  |  |  |
| 55 |  |  |  |  |
| 60 |  |  |  |  |
| 65 |  |  |  |  |
| 70 |  |  |  |  |
| 75 |  |  |  |  |

In calculating net profit, ignore the time differential between the initial derivative expense or receipt and the terminal payoff.

b. Graph the net profit for each of the three derivative positions, using net profit on the

Vertical axis and Sophia’s expiration date stock price on the horizontal axis. Label the

Breakeven (i.e., zero profit) point(s) on each graph.

c. Briefly describe the belief about the expiration date price of Sophia stock that an investor using each of these three positions implicitly holds