1. A call option with a strike price of $100 trades for $3.00 with 14 days remaining before expiration. What must the stock price be at expiration for the option still to be worth at least $3.00?

Ans. – 103 $

1. A put option with a strike price of $100 trades for $3.00 with 14 days remaining before expiration. What must the stock price be at expiration for the option still to be worth at least $3.00?

Ans. – 97 $

1. Suppose in each of the two examples described previously, the stock was $15 out of the money when the option traded for $3.00 with 14 days remaining. What can we conclude about the volatility of the underlying stock?

Ans. – Volatility of the stock is 150% assuming DY being 2% and risk free rate is 6%.

1. A stock must continually move in the direction of the strike price to offset the effect of time decay. Assume the following:

|  |  |  |
| --- | --- | --- |
| Stock Price | Call price | Days Remaining |
| $90 | $2.22 | 100 |
| $95 | $2.22 | 50 |

Can you determine the strike price without knowing the implied volatility or risk-free interest-rate?

1. Implied volatility for the call option in Q4 was 28.5%. In general terms what would be the effect of doubling or tripling the implied volatility?
2. Risk-free interest rate for the scenario in Q4 was 3.5%. What would be the effect of significantly increasing the rate of risk-free interest priced into the option contracts?

Ans. -

1. For a stock trading at $100, which option is more expensive, $105 call or $95 put? (Assume implied volatility, expiration date and so on, are all equal)

Ans. – Call option is more expensive because generally call options has unlimited risk whereas put options can go to zero in the worst case.

CE – 0.456

PE – 0.36225

1. If XYZ is trading at $102.50 and then $100 strike price call is worth $3.00, would it be better to exercise or to sell the option?

Ans. -

1. Suppose you are short the calls mentioned in Q9 (stock is $2.50 in-the-money and calls are trading for $3.00). How much money would be saved if the stock is called away from you?

Ans. -

1. Assume that it is expiration day and you are short at-the-money calls on a $100 stock – that is, the stock is trading right at the strike price. What are the risks associated with letting the option be exercised? If you already own the stock (covered calls), does it make sense to let it be called away?

Ans. – If option is exercised when it is at-the-money, I can profit the premium.

1. Delta represents the expected change in an option’s price for a 1-point change in the underlying security. If a $3.00 call option has a delta of 0.35, what will the new option price be if the stock

Suddenly rises $1.00?

Ans. – 3.35 $

1. Suppose in Q12 the stock climbed $2.00. Would the new option price be more or less than $3.70?

Ans. – More than 3.70$

1. Why is Gamma always positive while delta is negative for puts and positive for calls?

Ans. – Delta is a change in premium for 1 unit change in the underlying.

1. How is Gamma affected by time and distance to the strike price? When does gamma have the highest value?
2. How is gamma affected by volatility?
3. How is delta affected by volatility? How does this behavior vary with time?
4. Q17 related Delta to risk. How can the value of an option delta be used as a guide for structuring a hedge?
5. What would you expect the call option Delta to be for a stock that trades exactly at the strike price in the final few hours before expiration?
6. Consider a position composed of long deep in-the-money calls and short deep in-the-money puts for a stock trading at $100 as shown in the following table:

|  |  |
| --- | --- |
| **Stock Price** | **$100** |
| $90 call (long) | Delta=0.79 |
| $110 put (short) | Delta= - 0.70 |

What will the delta of each side be if the stock remains at $100 until expiration?

Ans. – 1. For call delta will be 0.999945

2. For put delta will be -0.9999

1. Suppose that in Q20 the $90 call originally cost $12.30 and the $110 put sold for $12.05- that is, the total position had a net cost of only 25₵. What was the final gain or loss?

Ans. – CE buy – 12.30 PE sell = 12.05

Sell – 10 buy = 10

Pl = -2.30 PL = 2.05

Total pl = -0.25

1. Consider a position composed of long out-of-the-money calls and long out-of-the-money puts for a stock trading at $100, as shown in the following table:

|  |  |
| --- | --- |
| **Stock Price** | **$100** |
| $110 call (long) | Delta= 0.30 |
| $90 put (long) | Delta= -0.21 |

What will the delta of each side be if the stock remains at $100 until expiration? What will the options be worth?

Ans. – 1. 0.028716

1. Over what range of stock prices will the loss at expiration be 100%?
2. Assume that the call in Q23 cost $2.56 and the put costs $1.86. At expiration, what underlying stock prices are break-even points for the trade? Is any collateral required for this position?
3. Assume that the trade originally described in Q23 decays at $0.00 with the stock at $100 and 1 day left before expiration. An unsubstantial rumor surfaces that the stock in question might be acquired, and implied volatility soars to very high levels. Is there a level of implied volatility that could restore the price of each option to its original value despite being $10 out-of-the money with only 1 day left? Would put and call deltas also be restored?
4. Which of the following call options suffers the greatest time decay (highest theta)?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stock Price ($)** | **Strike** | **Days**  **Remaining** | **Call ($)** | **Volatility** |
| 95 | 100 | 70 | 4.84 | 0.4 |
| 100 | 100 | 5 | 1.90 | 0.4 |
|  |  |  |  |  |

Ans. – 1. -18.378

2. -70.052

2nd call options suffers the greatest time decay as days to expiry are less.

1. Given the trading price of a call option, can the fair value of the put at the same strike price be determined? What information is needed?

Ans. -

1. Suppose you were to discover a mispriced set of options for which the call was relatively more expensive than the put. Is there a way to exploit this situation?
2. What is the primary difference between European and American style options?

Ans. – European options can be exercise only on the day of expiry, but American options can be exercised on any day before till expiry.

1. For a $100 strike price call with 2 days left before expiration, what stock price would result in the largest time decay (most negative theta)?

Ans. – 100$

1. Is it possible for the price of a call to rise or remain the same when the underlying stock or index falls?

Ans. -