

Options + Put-Call Parity

2.

You are given the following:

- The current price to buy one share of XYZ stock is 500.
- The stock does not pay dividends.
- The annual risk-free interest rate, compounded continuously, is 6%.
- A European call option on one share of XYZ stock with a strike price of K that expires in one year costs 66.59.
- A European put option on one share of XYZ stock with a strike price of K that expires in one year costs 18.64.

Using put-call parity, calculate the strike price, K .

- (A) 449
- (B) 452
- (C) 480
- (D) 559
- (E) 582

14.

The current price of a non-dividend paying stock is 40 and the continuously compounded annual risk-free rate of return is 8%. You are given that the price of a 35-strike call option is 3.35 higher than the price of a 40-strike call option, where both options expire in 3 months.

Calculate the amount by which the price of an otherwise equivalent 40-strike put option exceeds the price of an otherwise equivalent 35-strike put option.

- (A) 1.55
- (B) 1.65
- (C) 1.75
- (D) 3.25
- (E) 3.35

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35.

A customer buys a 50-strike put on an index when the market price of the index is also 50.

The premium for the put is 5. Assume that the option contract is for an underlying 100 units of the index.

Calculate the customer's profit if the index declines to 45 at expiration.

- (A) -1000
- (B) -500
- (C) 0
- (D) 500
- (E) 1000

Given the following information about 6-month European options a stock:

- \$85-strike call premium = \$7.25
- \$85-strike put premium = \$3.75

The risk-free rate is 6% convertible semiannually. Calculate the forward price for a 6-month forward contract.

- A. \$88.50 B. \$88.60 C. \$88.70 D. \$88.80 E. \$88.90

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40.

An investor is analyzing the costs of two-year, European options for aluminum and zinc at a particular strike price.

For each ton of aluminum, the two-year forward price is 1400, a call option costs 700, and a put option costs 550.

For each ton of zinc, the two-year forward price is 1600 and a put option costs 550.

The risk-free annual effective interest rate is a constant 6%.

Calculate the cost of a call option per ton of zinc.

- (A) 522
- (B) 800
- (C) 878
- (D) 900
- (E) 1231

44.

You are given the following information about two options, A and B:

- i) Option A is a one-year European put with exercise price 45.
- ii) Option B is a one-year American call with exercise price 55.
- iii) Both options are based on the same underlying asset, a stock that pays no dividends.
- iv) Both options go into effect at the same time and expire at $t = 1$.

You are also given the following information about the stock price:

- i) The initial stock price is 50.
- ii) The stock price at expiration is also 50.
- iii) The minimum stock price (from $t = 0$ to $t = 1$) is 46.
- iv) The maximum stock price (from $t = 0$ to $t = 1$) is 58.

Determine which of the following statements is true.

- (A) Both options A and B are "at-the-money" at expiration.
- (B) Both options A and B are "in-the-money" at expiration.
- (C) Both options A and B are "out-of-the-money" throughout each option's term.
- (D) Only option A is ever "in-the-money" at some time during its term.
- (E) Only option B is ever "in-the-money" at some time during its term.

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48.

For a certain stock, Investor A purchases a 45-strike call option while Investor B purchases a 135-strike put option. Both options are European with the same expiration date. Assume that there are no transaction costs.

If the final stock price at expiration is S , Investor A's payoff will be 12.

Calculate Investor B's payoff at expiration, if the final stock price is S .

- (A) 0
- (B) 12
- (C) 36
- (D) 57
- (E) 78

49.

The market price of Stock A is 50. A customer buys a 50-strike put contract on Stock A for 500. The put contract is for 100 shares of A.

Calculate the customer's maximum possible loss.

- (A) 0
- (B) 5
- (C) 50
- (D) 500
- (E) 5000

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50.

An investor bought a 70-strike European put option on an index with six months to expiration. The premium for this option was 1.

The investor also wrote an 80-strike European put option on the same index with six months to expiration. The premium for this option was 8.

The six-month interest rate is 0%.

Calculate the index price at expiration that will allow the investor to break even.

- (A) 63
- (B) 73
- (C) 77
- (D) 80
- (E) 87

53.

For each ton of a certain type of rice commodity, the four-year forward price is 300. A four-year 400-strike European call option costs 110.

The annual risk-free force of interest is a constant 6.5%.

Calculate the cost of a four-year 400-strike European put option for this rice commodity.

- (A) 10.00
- (B) 32.89
- (C) 118.42
- (D) 187.11
- (E) 210.00

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60.

Farmer Brown grows wheat, and will be selling his crop in 6 months. The current price of wheat is 8.50 per bushel. To reduce the risk of fluctuation in price, Brown wants to use derivatives with a 6-month expiration date to sell wheat between 8.60 and 8.80 per bushel. Brown also wants to minimize the cost of using derivatives.

The annual risk-free interest rate is 2% compounded continuously.

Which of the following strategies fulfills Farmer Brown's objectives?

- (A) Short a forward contract
- (B) Long a call with strike 8.70 and short a put with strike 8.70
- (C) Long a call with strike 8.80 and short a put with strike 8.60
- (D) Long a put with strike 8.60
- (E) Long a put with strike 8.60 and short a call with strike 8.80

62.

The price of an asset will either rise by 25% or fall by 40% in 1 year, with equal probability. A European put option on this asset matures after 1 year.

Assume the following:

- Price of the asset today: 100
- Strike price of the put option: 130
- Put option premium: 7
- Annual effective risk free rate: 3%

Calculate the expected profit of the put option.

- (A) 12.79
- (B) 15.89
- (C) 22.69
- (D) 27.79
- (E) 30.29