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CFA® Program Level I

Derivatives: 32 Free Practice Questions

2027 curriculum · 10 readings · answers and full explanations

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Version v2027.3 · October 2026

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CredGuild · CFA® Program Level I · Derivatives: 32 Free Practice Questions
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Contents

How to use these questions **1**

Derivatives (questions 1–32) **2**

Answers and explanations: Derivatives 11

Keep going at credguild.com **24**

How to use these questions

The 32 free questions on credguild.com for Derivatives, 2027 CFA® Program Level I curriculum, each with its answer and full explanation.

- The questions are grouped by topic and reading, in curriculum order. Answers and explanations follow each topic, on a new page, so you can work a topic before you check it.
- Each explanation says why the right answer is right and why each other option is wrong, and names the reading, with a link to its notes.
- At exam pace, 90 seconds a question, a topic of 40 questions takes about an hour.

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If these questions help you, pass the file on to someone else who is studying.

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CFA® PROGRAM LEVEL I · FREE PRACTICE QUESTIONS

Derivatives

Questions 1–32 · 10 readings

70 Derivative Instrument and Derivative Market Features

Question 1

Harlow Capital agrees with a dealer to buy 200 shares of Pemberton Mills in three months at a forward price of $48.00 per share. The contract is cash settled. On the settlement date, Pemberton shares trade at $44.50. The settlement of the contract is:

A The dealer pays Harlow $700.

B Harlow pays the dealer $700.

C Harlow pays the dealer $9,600.

Question 2

A client asks her adviser how exchange-traded derivatives differ from contracts arranged with dealers. Which of the adviser's statements about exchange-traded derivatives is *least accurate*?

A They are backed by a central clearinghouse.

B They are traded by exchange members at a central exchange.

C They are generally illiquid.

Question 3

A portfolio manager is explaining to a trustee why an interest rate swap held by the fund is classified as a derivative. The defining feature she should point to is that the instrument's value:

A is derived from the value of an underlying asset, rate, or index.

B is set out in a contract between two counterparties.

C is determined in trading that takes place away from an organized exchange.

71 Forward vs Futures

Question 4

Laszlo Bencze holds a long futures position. The initial margin on his account is $3,800 and the maintenance margin is $2,900. After today's mark-to-market, his account balance is $2,650. If Bencze wants to keep the position open, the deposit he must make is *closest* to:

A $250.

B $1,150.

C $2,900.

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Question 5

Bergen Pension Fund owns bonds issued by Holloway Freight. It enters a credit default swap as the buyer of credit protection on those bonds. Under the swap, the fund:

A issues a note whose payments come from the cash flows of the Holloway bonds.

B exchanges the total return on the Holloway bonds for a fixed or floating rate.

C makes a series of periodic payments to the protection seller.

Question 6

Tobias Grant buys a call option on Wexford Bio shares with an exercise price of $36.00 for a premium of $3.40, when the shares trade at $38.90. At expiration the shares are priced at $37.10. Grant's net profit or loss on the call is *closest* to:

A −$3.40.

B −$2.30.

C $2.30.

Question 7

A trainee lists features of forward commitments. Which item on her list is *least accurate*?

A The underlying can be a stock index or a portfolio.

B Each party is legally obligated to act at a future date.

C Either party can walk away at settlement without penalty.

72 Derivative Benefits, Risks, and Issuer and Investor Uses

Question 8

A manager wants short exposure to a commodity but finds that borrowing physical inventory for a short sale is impractical. Which feature of derivatives is *most useful* to the manager?

A They eliminate basis risk whenever a derivative is used as a hedge.

B Short exposure is generally as easy to establish as long exposure.

C They prevent implicit leverage from magnifying gains and losses on a position.

Question 9

Which of the following hedges is *most* exposed to basis risk?

A A gold refiner sells gold forwards that match the quantity, grade and delivery date of a sale it has already agreed.

B A Canadian importer buys a US dollar forward for the amount and settlement date of a dollar invoice it must pay.

C A manager of 40 regional bank stocks sells forwards on a broad national equity index equal to the portfolio's value.

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Question 10

Marlowe Industries carries its fixed-rate notes payable at fair value and applies hedge accounting. To reduce swings in the reported value of the notes as interest rates change, it enters an interest rate swap in which it pays a floating rate and receives a fixed rate. This hedge is best classified as a:

A fair value hedge.

B cash flow hedge.

C net investment hedge.

73 Arbitrage, Replication, and the Cost of Carry in Pricing Derivatives

Question 11

The no-arbitrage approach used to value derivatives relies on the assumption that:

A any arbitrage opportunities that appear are exploited quickly.

B investors are risk neutral.

C arbitrage opportunities never arise in actual markets.

Question 12

A share of Halvorsen Robotics, which pays no dividends, trades at $80.00, and the 1-year risk-free rate is 4%. A dealer quotes a 1-year forward price on the share of $82.50. Assuming no transaction costs, which strategy earns an arbitrage profit?

A Buy the forward, sell the share short, and invest the proceeds at 4%.

B Sell the forward and borrow at 4% to buy the share.

C None, because the forward price is above the spot price.

Question 13

An analyst compares forwards on two commodities with the same spot price and the same time to settlement. Commodity P has no costs or benefits of holding. For commodity Q, storage and insurance costs exceed its convenience yield. Compared with the forward price on P, the no-arbitrage forward price on Q will be:

A Lower.

B Higher.

C The same.

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74 Pricing and Valuation of Forward Contracts and for an Underlying With Varying Maturities

Question 14

Eight months ago, Selma Varga entered a 1-year long forward contract on a share that has no dividends or other costs or benefits of holding, at a forward price of $55.00. The share now trades at $57.00 and the annual risk-free rate is 3%. The value of Varga's forward position is *closest* to:

A $1.98.

B $2.00.

C $2.54.

Question 15

Annual-pay zero-coupon yields are 2.4% for 1 year, 2.8% for 2 years, and 3.1% for 3 years. The implied 1-year forward 2-year rate (1y2y), stated as an annual rate, is *closest* to:

A 3.45%.

B 3.70%.

C 7.02%.

Question 16

A company expects to invest surplus cash for three months, starting four months from today. It wants to lock in the return on that future investment with an FRA. The company should enter the FRA as the party that:

A pays fixed and receives MRR.

B receives fixed and pays MRR.

C receives both fixed and MRR.

75 Pricing and Valuation of Futures Contracts

Question 17

A trader buys one futures contract on 50 tonnes of cocoa at a price of 4,120 per tonne. At the end of the day, the settlement price is 4,180. After the daily mark-to-market, which statement is *most accurate*?

A The contract price and contract value both change.

B The contract price is unchanged, but the contract value changes.

C The contract price changes, and the contract value returns to zero.

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Question 18

Analyst Farah Idris observes that when the price of a commodity rises, short-term interest rates also tend to rise. For an investor seeking long exposure, which statement is *most accurate* about a long futures contract compared with an otherwise equivalent forward that has no mark-to-market?

A The long futures contract is more attractive than the forward.

B The long forward contract is more attractive than the futures.

C Both contracts are equally attractive.

Question 19

A fund manager is long 8 three-month MRR futures contracts, each on a notional principal of $1,000,000. Over the day, the futures price falls from 96.40 to 96.25. The change in the value of the manager's position is:

A A loss of $12,000.

B A loss of $3,000.

C A gain of $3,000.

76 Interest Rate Swap

Question 20

An analyst breaks a fixed-for-floating interest rate swap into a series of forward contracts (FRAs), each with a contract rate equal to the swap's fixed rate. For this series to replicate a swap entered at market terms, the forward contracts must have:

A values that are each equal to zero at swap initiation.

B values that sum to zero at swap initiation.

C values that sum to zero at swap expiration.

Question 21

Six months after Orsolya Farms entered a 5-year interest rate swap as the fixed-rate payer, expected future MRRs have risen. Which statement is *most accurate*?

A The swap's value to Orsolya has fallen; the swap price is unchanged.

B The swap's value to Orsolya has risen; the swap price has also risen.

C The swap's value to Orsolya has risen; the swap price is unchanged.

Question 22

Rhea Kapoor wants to use cash market transactions to reproduce the net cash flows of the floating-rate payer in a plain vanilla interest rate swap. She could best do so by:

A taking out a floating-rate loan and buying a fixed-rate bond.

B taking out a fixed-rate loan plus a strip of zero-value FRAs.

C taking out a floating-rate loan plus a strip of zero-value FRAs.

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77 Pricing and Valuation of Options

Question 23

Hana Novak owns two options on the same stock: a call with an exercise price of $62 and a put with an exercise price of $70. If the stock currently trades at $66:

A neither option is in the money.

B only the call option is in the money.

C both options are in the money.

Question 24

Which statement about a European put option is *most accurate*?

A Its exercise value is the stock price less the option's exercise price.

B Its time value is the sum of its market price and its exercise value.

C Its exercise value is the exercise price less the stock price, if positive.

Question 25

Compared with forward commitments, why must a different no-arbitrage approach be used to price options?

A Options have a positive value at initiation and one-sided payoffs.

B Options cannot be replicated with the underlying and a bond.

C Options are valued with a risk-adjusted discount rate only.

Question 26

Tomás Reyes has bought a European call option and written a European put option on the same equity index. Holding all other factors constant, an increase in the risk-free interest rate will increase the value of:

A neither of his positions.

B only one of his positions.

C both of his positions.

78 Put Call Parity

Question 27

A portfolio manager wants to reproduce the expiration payoff of a European put without trading any puts. She can trade the stock, a European call with the same strike and expiration, and a risk-free pure-discount bond that pays the exercise price X at expiration. Based on put–call parity, which combination should she hold?

A Short the stock, long the call, short a pure-discount bond that pays X.

B Short the stock, long the call, long a pure-discount bond that pays X.

C Long the stock, short the call, short a pure-discount bond that pays X.

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Question 28

Castellan Group is financed with common equity and a single issue of zero-coupon debt. When options theory is applied to this capital structure, the firm's credit risk can be modeled as a:

A put option written by the debtholders and held by the shareholders.

B call option written by the debtholders and held by the shareholders.

C call option written by the shareholders and held by the debtholders.

Question 29

Shares of Brisa Networks trade at $73.00. A 6-month European call on the shares with an exercise price of $70.00 is priced at $6.20, and the annual risk-free rate is 4%. The shares pay no dividends. Based on put–call parity, the value of a 6-month European put with the same exercise price is *closest* to:

A $1.84.

B $3.20.

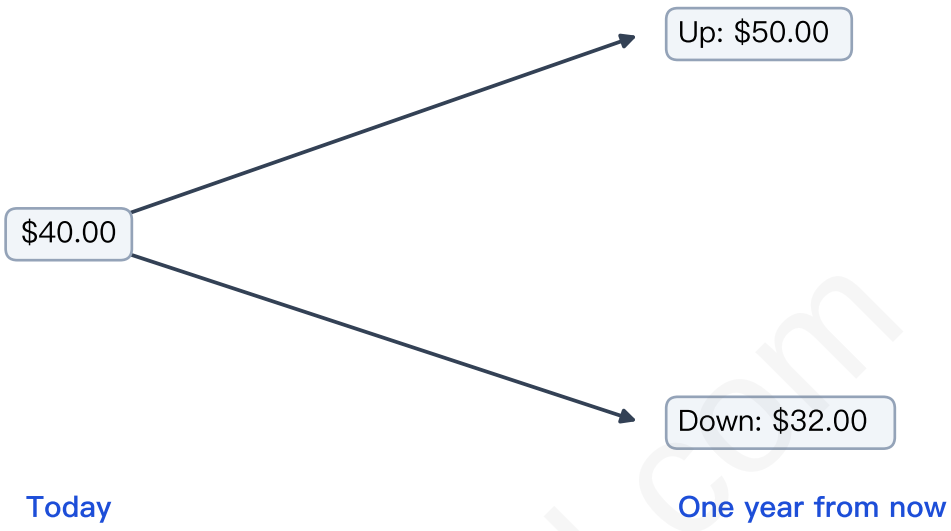
C $10.56.

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79 Binomial Option Pricing Model

Question 30

Shares of Solvay Ridge follow the one-period binomial tree shown below. The one-year risk-free rate is 4%.



One-period binomial tree for Solvay Ridge shares

An analyst wants to write one-year European calls on the shares with an exercise price of $44 and hold shares so that the combined position has the same value at expiration whatever the share price. The number of shares to hold per call written is *closest* to:

A 0.32.

B 0.33.

C 0.35.

Question 31

Shares of Keswick Marine trade at $60. In one year they will be worth either $78 after an up-move or $51 after a down-move. The one-year risk-free rate is 3%, and the risk-neutral probability of an up-move is 0.40. An analyst estimates the actual probability of an up-move at 0.55. Using risk-neutral valuation, the value of a one-year European call on the shares with an exercise price of $65 is *closest* to:

A $5.05.

B $5.20.

C $6.94.

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Question 32

In a one-period binomial model, a call is valued by combining one short call with h shares of the underlying so that the portfolio's value at the end of the period is the same after an up-move or a down-move. Rearranging this relationship, a position that replicates a long call consists of:

A buying h shares and also lending at the risk-free rate.

B selling h shares short and lending at the risk-free rate.

C buying h shares, financed partly by borrowing at the risk-free rate.

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DERIVATIVES

Answers and explanations

Answer key: 1. B · 2. C · 3. A · 4. B · 5. C · 6. B · 7. C · 8. B · 9. C · 10. A · 11. A · 12. A · 13. B · 14. C · 15. A · 16. B · 17. C · 18. A · 19. B · 20. B · 21. C · 22. A · 23. C · 24. C · 25. A · 26. C · 27. B · 28. A · 29. A · 30. B · 31. A · 32. C

Question 1 **Answer: B**

In a cash-settled forward only the gain or loss changes hands. Harlow, the buyer (long), agreed to pay $48.00 for shares now worth $44.50, so it has a loss and pays the difference to the dealer (the short).

$$\text{Payoff to long} = (S_T - F) \times \text{shares} = (44.50 - 48.00) \times 200 = -\$700$$

The long (Harlow) has a $700 loss and pays it to the short (the dealer). Economically this equals delivery: Harlow would pay $9,600 for shares it could sell for $200 \times 44.50 = \$8{,}900$.

Why the other options are wrong

- **A.** This reverses the direction. The buyer of a forward loses when the spot price at settlement is below the forward price, so the buyer pays the seller.
- **C.** $9,600 is the full forward price ($200 \times \$48$) that Harlow would pay in a deliverable contract in exchange for the shares. With cash settlement, only the net difference is paid.

Key takeaway Cash settlement transfers only $|S_T - F| \times$ size, from the losing side to the winning side.

Reading 70: Derivative Instrument and Derivative Market Features. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-instrument-and-derivative-market-features/

Question 2 **Answer: C**

Exchange-traded derivatives use standardized contracts, which makes them liquid in most cases: a trader can exit easily by taking an offsetting position. Illiquidity is a characteristic of customized OTC contracts, so this statement is the inaccurate one.

Why the other options are wrong

- **A.** Accurate. Exchange-traded derivatives are backed by a central clearinghouse that guarantees performance.
- **B.** Accurate. They trade at a centralized location, the exchange, through exchange members (market makers).

Key takeaway Exchange-traded: standardized, liquid, transparent, cleared centrally. OTC: customized, less liquid, counterparty risk.

Reading 70: Derivative Instrument and Derivative Market Features. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-instrument-and-derivative-market-features/

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Question 3 **Answer: A**

A derivative is a security whose value is derived from the value of something else, the underlying (another security, a commodity, an index, or a variable such as an interest rate). For an interest rate swap, the underlying is the market reference rate, so the swap's value depends on how that rate moves.

Why the other options are wrong

- **B.** Many contracts between two parties (a loan agreement, for example) are not derivatives. A derivatives contract does state the price at which a future transaction will (or may) take place, but being a contract does not by itself make an instrument a derivative.
- **C.** Where a contract trades does not decide whether it is a derivative. Futures and some options trade on organized exchanges and are still derivatives; forwards and most swaps trade OTC.

Key takeaway A derivative's value is derived from an underlying. Contract form and trading venue are features of derivatives but do not define them.

Reading 70: Derivative Instrument and Derivative Market Features. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-instrument-and-derivative-market-features/

Question 4 **Answer: B**

Because the balance ($2,650) has fallen below the maintenance margin ($2,900), Bencze receives a margin call. In futures trading the deposit must restore the account to the initial margin level, otherwise the position is closed out.

Balance $= \$2{,}650 < \$2{,}900$ maintenance margin $\Rightarrow$ margin call.

$$\text{Deposit} = \text{initial margin} - \text{current balance} = 3{,}800 - 2{,}650 = \$1{,}150$$

Why the other options are wrong

- **A.** $250 only restores the account to the maintenance margin $(2{,}900 - 2{,}650)$. That is the rule for equity margin accounts. Futures accounts must be restored to the initial margin.
- **C.** $2,900 is the maintenance margin itself. There is no rule requiring a deposit equal to the maintenance margin; the deposit is whatever brings the balance back to the initial margin.

Key takeaway After a futures margin call, the account is topped up to the initial margin whenever the balance drops below the maintenance margin.

Reading 71: Forward Commitment and Contingent Claim Features and Instruments. Notes: credguild.com/cfa/level-1/notes/derivatives/forward-vs-futures/

Question 5 **Answer: C**

In a credit default swap the protection buyer makes a series of fixed periodic payments to the protection seller. In return, the seller pays an amount that offsets the loss in value if the reference bond suffers a credit event such as default. The fund is effectively buying insurance on its Holloway bonds.

Why the other options are wrong

- **A.** A note funded by cash flows from an underlying bond is not a CDS. The CDS protection buyer issues nothing; it pays periodic premiums and receives a payment only after a credit event.

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- **B.** Exchanging the bond's total return for a fixed or floating rate describes a different credit derivative. In a CDS the buyer pays fixed periodic premiums and receives a payment only after a credit event.

Key takeaway CDS: protection buyer pays periodic premiums; protection seller pays only if a credit event occurs.

Reading 71: Forward Commitment and Contingent Claim Features and Instruments. Notes: credguild.com/cfa/level-1/notes/derivatives/forward-vs-futures/

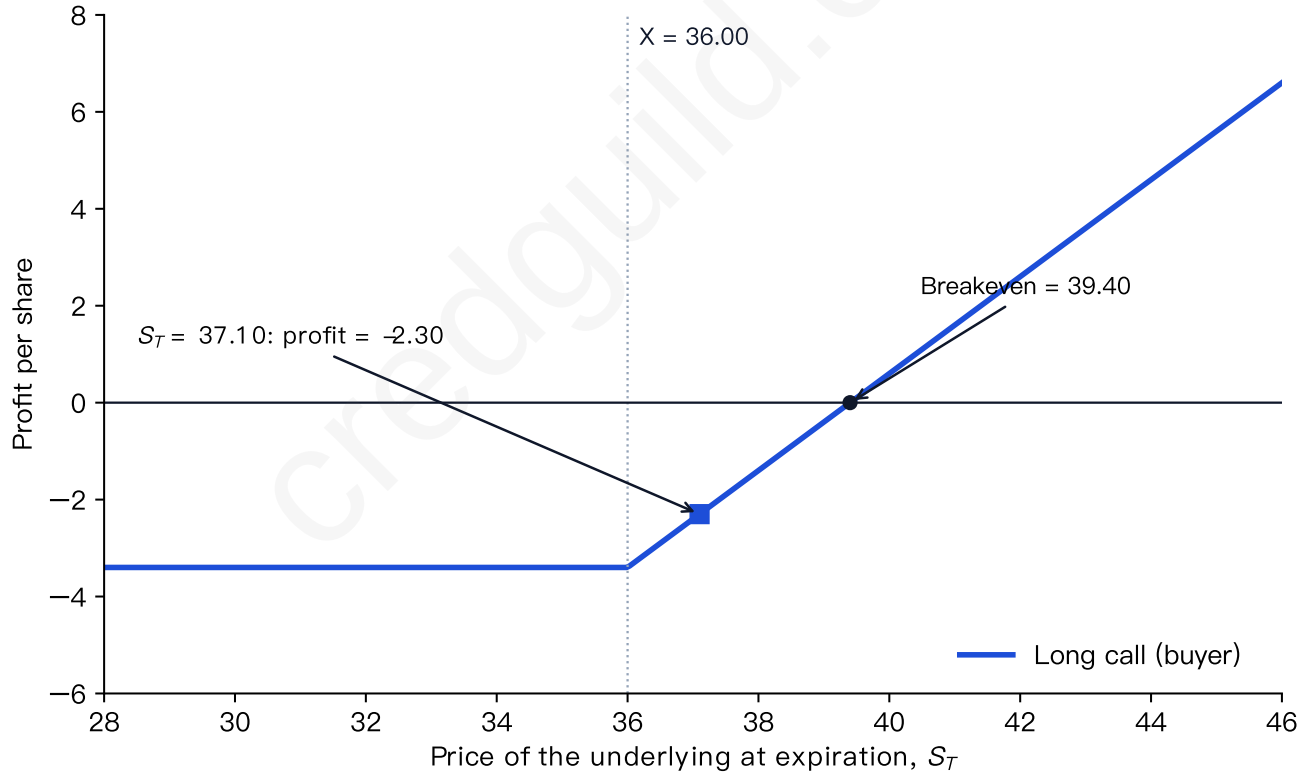
Question 6 **Answer: B**

At expiration the call is in the money by $1.10, so Grant exercises it and recovers part of the premium. His net result is the exercise value minus the $3.40 premium, a loss of $2.30. The share price when he bought the call ($38.90) does not affect the result.

$$c_T = \max(0,\ 37.10 - 36.00) = \$1.10$$

$$\text{Profit} = c_T - c_0 = 1.10 - 3.40 = -\$2.30$$

Breakeven $= X + c_0 = 36.00 + 3.40 = \$39.40$; the share price of $37.10 is below it, so there is a loss.



Long call profit: exercise price $36.00, premium $3.40

Why the other options are wrong

- **A.** A loss of the full $3.40 premium would occur only if the call expired out of the money. Here $S_T > X$, so exercising recovers $1.10.

- **C.** +$2.30 has the sign reversed: the $1.10 exercise value is smaller than the $3.40 premium paid, so the position loses money.

Key takeaway Exercise whenever $S_T > X$. Even below breakeven, exercising reduces the loss.

Reading 71: Forward Commitment and Contingent Claim Features and Instruments. Notes: credguild.com/cfa/level-1/notes/derivatives/forward-vs-futures/

Question 7 **Answer: C**

Forward commitments legally bind both parties to carry out a specified action at a future date, so neither side can simply walk away. The underlying can be an individual asset, a stock index, a portfolio or a rate.

Why the other options are wrong

- **A.** Accurate. Forward commitments can be written on a stock index or a portfolio as well as on single assets.
- **B.** Accurate. Both parties are legally bound to perform, which is what separates a forward commitment from a contingent claim.

Key takeaway A forward commitment binds both sides. Only the holder of a contingent claim, such as an option, has the right to walk away.

Reading 71: Forward Commitment and Contingent Claim Features and Instruments. Notes: credguild.com/cfa/level-1/notes/derivatives/forward-vs-futures/

Question 8 **Answer: B**

Selling a forward or futures contract usually creates short exposure without borrowing and selling the physical commodity. This operational advantage is especially important for assets that are difficult to short in the cash market.

Why the other options are wrong

- **A.** A derivatives hedge can still have basis risk when its underlying or settlement date does not match the exposure.
- **C.** Derivatives often provide substantial implicit leverage; they do not remove it.

Key takeaway Derivatives can make short exposure practical when a cash market short sale is difficult or impossible.

Reading 72: Derivative Benefits, Risks, and Issuer and Investor Uses. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-benefits-risks-and-issuer-and-investor-uses/

Question 9 **Answer: C**

Basis risk arises when the underlying of a derivative differs from the position being hedged, or when the hedge horizon differs from the derivative's settlement date. Returns on 40 regional bank stocks can diverge from returns on a broad index, so the index forward reduces the portfolio's risk but does not remove it.

Why the other options are wrong

- **A.** The forward's underlying, grade and date all match the planned sale, so the hedge leaves little basis risk. The main remaining risk is counterparty credit risk on the forward.
- **B.** The forward is in the same currency, for the same amount and on the same date as the invoice, so its value moves one for one with the exposure. There is no mismatch to create basis risk.

Key takeaway Look for a mismatch: a different underlying (an index against a narrower portfolio) or a different date (settlement after the exposure ends) creates basis risk.

Reading 72: Derivative Benefits, Risks, and Issuer and Investor Uses. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-benefits-risks-and-issuer-and-investor-uses/

Question 10 **Answer: A**

A fair value hedge offsets changes in the balance-sheet value of an asset or liability. By paying floating and receiving fixed, Marlowe effectively converts its fixed-rate liability into a low-duration floating-rate one, so changes in the swap's value offset changes in the fair value of the notes.

Why the other options are wrong

- **B.** A cash flow hedge would apply if the swap converted a floating-rate liability into fixed-rate payments, making interest cash flows certain. Marlowe's notes already pay a fixed rate, and the hedge targets their value.
- **C.** A net investment hedge reduces the volatility of the reported value of a foreign subsidiary's equity. No foreign subsidiary is involved.

Key takeaway A swap on fixed-rate debt that stabilizes its value is a fair value hedge; a swap on floating-rate debt that fixes its payments is a cash flow hedge.

Reading 72: Derivative Benefits, Risks, and Issuer and Investor Uses. Notes: credguild.com/cfa/level-1/notes/derivatives/derivative-benefits-risks-and-issuer-and-investor-uses/

Question 11 **Answer: A**

Derivative valuation assumes that any arbitrage opportunity is quickly traded away when it appears. That trading drives assets with identical future cash flows to the same price. It does not require that arbitrage never happens, and it makes no assumption about investors' attitude to risk.

Why the other options are wrong

- **B.** No-arbitrage pricing discounts at the risk-free rate because a position combining the derivative with its replicating portfolio (one long, the other short) has a certain payoff. The result does not depend on investors' risk preferences, so no assumption that investors are risk neutral is needed.
- **C.** Arbitrage opportunities can and do arise (small ones may even persist when transaction costs exceed the gain); the assumption is that they are quickly eliminated.

Key takeaway No-arbitrage pricing assumes that arbitrage is competed away quickly, so identical payoffs have identical prices.

Reading 73: Arbitrage, Replication, and the Cost of Carry in Pricing Derivatives. Notes: credguild.com/cfa/level-1/notes/derivatives/arbitrage-replication-and-the-cost-of-carry-in-pricing-derivatives/

Question 12 **Answer: A**

Arbitrage is possible whenever the forward price differs from the future value of the spot price. Here the no-arbitrage price is \$83.20, so the quoted \$82.50 is too low: buy the forward and replicate a short forward by shorting the share and investing the proceeds.

$$S_0(1+R_f)^T = 80.00 \times 1.04 = \$83.20 > \$82.50$$

Today: short the share (+$80.00), invest at 4%, buy the forward at $82.50 (no cost). Net outlay 0.

In one year: investment pays $80 \times 1.04 = \$83.20$; pay $82.50 for the share under the forward and return it to close the short. Profit $= 83.20 - 82.50 = \$0.70$, riskless.

Why the other options are wrong

- **B.** Selling the forward and carrying the share is the arbitrage when the forward is too expensive. At $82.50 it would lose $83.20 - 82.50 = \$0.70$.
- **C.** Comparing the forward price with the spot price ignores the financing cost. The right benchmark is $S_0(1 + R_f)^T = \$83.20$, and the quote is below it.

Key takeaway If the forward is too cheap, buy the forward, short the spot asset and lend the proceeds. If it is too expensive, sell the forward, borrow and buy the spot asset.

Reading 73: Arbitrage, Replication, and the Cost of Carry in Pricing Derivatives. Notes: credguild.com/cfa/level-1/notes/derivatives/arbitrage-replication-and-the-cost-of-carry-in-pricing-derivatives/

Question 13 **Answer: B**

When the costs of holding the underlying exceed the benefits, the net cost of carry is positive, which raises the no-arbitrage forward price above the level it would have with no costs or benefits.

$$F_0(T) = [S_0 + PV_0(\text{cost}) - PV_0(\text{benefit})](1 + R_f)^T$$

For Q, $PV_0(\text{cost}) - PV_0(\text{benefit}) > 0$, so $F_Q > S_0(1 + R_f)^T = F_P$.

Why the other options are wrong

- **A.** A lower forward price would result if the benefits of holding (convenience yield) exceeded the costs.
- **C.** Holding costs and benefits do affect the forward price; they cancel only if they are equal in present value.

Key takeaway Net costs raise the forward price; net benefits lower it.

Reading 73: Arbitrage, Replication, and the Cost of Carry in Pricing Derivatives. Notes: credguild.com/cfa/level-1/notes/derivatives/arbitrage-replication-and-the-cost-of-carry-in-pricing-derivatives/

Question 14 **Answer: C**

For an underlying that is costless to hold and pays nothing, a long forward's value before expiration is the spot price less the present value of the forward price. Four months remain, so the forward price is discounted for 4/12 of a year.

$$V_t = S_t - \frac{F_0(T)}{(1 + R_f)^{T-t}} = 57.00 - \frac{55.00}{1.03^{4/12}} = 57.00 - \frac{55.00}{1.009902} = 57.00 - 54.46 = \$2.54$$

Why the other options are wrong

- **A.** $1.98 is the present value of the difference, $(57 - 55)/1.03^{4/12}$. It wrongly discounts the spot price as well as the forward price.
- **B.** $2.00 is the undiscounted difference between spot and forward prices. That would be the value only at expiration.

Key takeaway Discount only the forward price, for the time remaining $(T - t)$.

Reading 74: Pricing and Valuation of Forward Contracts and for an Underlying With Varying Maturities. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-forward-contracts-and-for-an-underlying-with-varying-maturities/

Question 15 **Answer: A**

The 1y2y rate is the rate for a 2-year loan starting in one year. Investing for three years at the 3-year spot rate must give the same result as investing for one year at the 1-year spot rate and then for two years at the 1y2y rate.

$$(1+Z_3)^3 = (1+Z_1)(1+F_{1,2})^2$$

$$F_{1,2} = \left[\frac{1.031^3}{1.024}\right]^{1/2} - 1 = \left[\frac{1.095913}{1.024}\right]^{1/2} - 1 = 1.070227^{1/2} - 1 = 3.45\%$$

Why the other options are wrong

- **B.** 3.70% is the 2y1y rate (a 1-year loan starting in two years), $1.031^3/1.028^2 - 1$. The first number in the notation is the start date and the second is the length of the loan.
- **C.** 7.02% is the cumulative 2-year forward return, $1.031^3/1.024 - 1$. It has not been converted to an annual rate by taking the square root.

Key takeaway AyBy: divide $(1+Z_{A+B})^{A+B}$ by $(1+Z_A)^A$, then take the B-th root.

Reading 74: Pricing and Valuation of Forward Contracts and for an Underlying With Varying Maturities. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-forward-contracts-and-for-an-underlying-with-varying-maturities/

Question 16 **Answer: B**

A future lender or investor wants to protect against a fall in MRR. Receiving the fixed FRA rate and paying MRR produces a gain when MRR falls, offsetting the lower return earned on the future investment.

Why the other options are wrong

- **A.** Paying fixed and receiving MRR benefits from rising rates and is the hedge for a future borrower.
- **C.** An FRA settles a single net payment based on the difference between the fixed rate and MRR; one party does not receive both legs.

Key takeaway A future borrower pays fixed and receives floating; a future lender receives fixed and pays floating.

Reading 74: Pricing and Valuation of Forward Contracts and for an Underlying With Varying Maturities. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-forward-contracts-and-for-an-underlying-with-varying-maturities/

Question 17 **Answer: C**

The daily mark-to-market credits the trader's account with the day's gain and resets the futures price to the new settlement price. Because the gain has already been paid, a contract at the new price of 4,180 has a value of zero again.

Gain credited $= (4{,}180 - 4{,}120) \times 50 = 3{,}000$.

New contract price $= 4{,}180$; value after mark-to-market $= 0$.

Why the other options are wrong

- **A.** The price does change, but the change in value is only temporary. Once the gain is settled in cash, the value returns to zero.
- **B.** This describes a forward without mark-to-market, whose price is fixed while its value moves. A futures price is reset every day.

Key takeaway A futures price resets daily and its value goes back to zero; a forward price is fixed while its value fluctuates.

Reading 75: Pricing and Valuation of Futures Contracts. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-futures-contracts/

Question 18 **Answer: A**

Idris describes a positive correlation between interest rates and the underlying's price. Daily settlement then gives the long futures cash (excess margin) when the price rises and rates are high, so it can be reinvested at high rates, and requires deposits when the price falls and rates are low, so the opportunity cost of those deposits is small. That makes the futures more desirable than the forward.

Why the other options are wrong

- **B.** The forward is preferred when the correlation is negative, which is the opposite of what Idris observes.
- **C.** Equal attractiveness requires interest rates that are constant or uncorrelated with the futures price.

Key takeaway Positive correlation between rates and the underlying's price makes long futures worth more than long forwards.

Reading 75: Pricing and Valuation of Futures Contracts. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-futures-contracts/

Question 19 **Answer: B**

Interest rate futures are quoted as 100 minus the rate, so a price drop from 96.40 to 96.25 means the implied MRR rose from 3.60% to 3.75%, a 15 bp increase. A long futures position loses when rates rise, by the basis point value per contract for each basis point.

Implied MRR: $100 - 96.40 = 3.60\%$ and $100 - 96.25 = 3.75\% \Rightarrow +15$ bp.

$$\text{BPV} = 1{,}000{,}000 \times 0.25 \times 0.0001 = \$25$$

$$\text{Change} = -15 \times 25 \times 8 = -\$3{,}000$$

Why the other options are wrong

- **A.** \$12,000 uses a BPV of \$100 per contract. It ignores that the rate applies to a 3-month period (0.25 year).
- **C.** The sign is reversed. A falling futures price (rising rate) produces a loss for the long.

Key takeaway Rate futures price $= 100 - \text{MRR}$; $\text{BPV} = \text{notional} \times \text{period} \times 0.0001$; longs lose when rates rise.

Reading 75: Pricing and Valuation of Futures Contracts. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-futures-contracts/

Question 20 **Answer: B**

Because every FRA in the series uses the same contract rate (the swap fixed rate), the individual FRAs will generally not be zero-value contracts: some have positive and some negative value. A swap entered at market terms has zero value at initiation, so the FRA values must add up to zero at that date.

Why the other options are wrong

- **A.** Zero-value FRAs would each need their own no-arbitrage contract rate. With a single common rate, individual values are generally non-zero; only their sum is zero.
- **C.** The zero-sum condition applies at initiation, when the swap is priced to have zero value. At expiration, the values reflect realized rates and need not sum to zero.

Key takeaway A swap is a series of off-market FRAs whose values sum to zero at inception.

Reading 76: Pricing and Valuation of Interest Rates and Other Swaps. Notes: credguild.com/cfa/level-1/notes/derivatives/interest-rate-swap/

Question 21 **Answer: C**

The fixed-rate payer receives floating payments. Higher expected MRRs raise the present value of the floating payments it will receive relative to the fixed payments it owes, so the swap's value to Orsolya increases. The swap price, the fixed rate set in the contract, does not change.

Why the other options are wrong

- **A.** The direction is reversed: a rise in expected rates increases the value of the fixed-rate payer's position (it would decrease the floating-rate payer's).
- **B.** The value rises, but the price is the fixed rate agreed at inception and does not move with market rates.

Key takeaway When expected rates rise, the fixed-rate payer gains and the floating-rate payer loses. The swap price does not change.

Reading 76: Pricing and Valuation of Interest Rates and Other Swaps. Notes: credguild.com/cfa/level-1/notes/derivatives/interest-rate-swap/

Question 22 **Answer: A**

The floating-rate payer pays MRR and receives fixed payments on the notional principal. Borrowing at a floating rate (a floating-rate loan or note) and investing the proceeds in a fixed-rate bond produces the same net cash flows.

Why the other options are wrong

- **B.** Borrowing at a fixed rate creates fixed payments, the opposite of the floating-rate payer's obligation, and zero-value FRAs would not replicate the swap anyway.
- **C.** The swap's net payments are equivalent to a series of FRAs that all carry the swap's single fixed rate, so those FRAs would generally not be zero-value FRAs; zero-value FRAs would each have a different contract rate. A floating-rate loan combined with zero-value FRAs therefore does not reproduce the floating-rate payer's cash flows.

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Key takeaway The floating-rate payer's position equals a short floating-rate note plus a long fixed-rate bond; the fixed-rate payer's position is the reverse.

Reading 76: Pricing and Valuation of Interest Rates and Other Swaps. Notes: credguild.com/cfa/level-1/notes/derivatives/interest-rate-swap/

Question 23 **Answer: C**

The call is in the money because it lets Novak buy at $62 a stock worth $66 ($S - X = 4$). The put is in the money because it lets her sell at $70 a stock worth $66 ($X - S = 4$).

Why the other options are wrong

- **A.** Each option would give a positive payoff if exercised now, so both are in the money.
- **B.** The call is in the money, but so is the put, because its exercise price is above the market price.

Key takeaway Check each option separately: call ITM if $S > X$, put ITM if $S < X$. With different strikes both can be in the money at once.

Reading 77: Pricing and Valuation of Options. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-options/

Question 24 **Answer: C**

A put pays off when the stock price is below the exercise price. Its exercise value is therefore $\max(0,\ X - S)$: the exercise price less the stock price when that amount is positive, and zero otherwise. Exercise value is also called intrinsic value.

Why the other options are wrong

- **A.** $S - X$ is the exercise value of a call. For a put the subtraction runs the other way.
- **B.** Time value is the market price minus the exercise value. Adding the two gives more than the premium itself.

Key takeaway Call exercise value $= \max(0,\ S - X)$; put exercise value $= \max(0,\ X - S)$. Time value is the premium minus the exercise value.

Reading 77: Pricing and Valuation of Options. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-options/

Question 25 **Answer: A**

Forward commitments are priced so that their value at initiation is zero to both parties, and both sides face essentially unlimited gains and losses. An option buyer pays a premium, so the option has a positive value at initiation, and the payoffs are one-sided (the buyer's loss and the writer's gain are limited to the premium). Options are therefore priced by replication: combining the option with a pure discount bond and a long or short position in the underlying.

Why the other options are wrong

- **B.** Contingent claims are priced by replication: the option is combined with a risk-free pure discount bond and a position in the underlying.
- **C.** No-arbitrage and replication pricing discount at the risk-free rate. A risk-adjusted discount rate is not needed.

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Key takeaway Forwards have zero initial value and two-sided payoffs. Options have a positive premium and one-sided payoffs, so they are priced by replication.

Reading 77: Pricing and Valuation of Options. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-options/

Question 26 **Answer: C**

A higher risk-free rate raises call values and lowers put values. Reyes is long the call, so that position gains; he is short the put, so the fall in the put's value also benefits him. Both positions become more valuable.

Why the other options are wrong

- **A.** Neither position would gain only if the rate change hurt both of them. Because a rate increase raises call values and lowers put values, the long call gains and the short put also gains.
- **B.** Only one position would gain if Reyes were long both options (or short both), because the rate moves call and put values in opposite directions. Being long the call and short the put, he benefits on both.

Key takeaway Rates move call and put values in opposite directions; then flip the sign for any short position.

Reading 77: Pricing and Valuation of Options. Notes: credguild.com/cfa/level-1/notes/derivatives/pricing-and-valuation-of-options/

Question 27 **Answer: B**

Solving put–call parity for the put gives $p = c - S + X(1 + R_f)^{-T}$: a long call, a short stock position and an investment of $PV(X)$ in the risk-free bond (a long bond position). At expiration the combination pays exactly $\max(0, X - S_T)$.

Why the other options are wrong

- **A.** Borrowing (short bond) has the wrong sign; the put equation adds $PV(X)$, so the bond is held long.
- **C.** This is the negative of the synthetic put (the position of someone who has sold a put synthetically).

Key takeaway Put side of parity: $p = c - S + PV(X)$, so hold a long call, short stock and a long bond.

Reading 78: Option Replication Using Put-Call Parity. Notes: credguild.com/cfa/level-1/notes/derivatives/put-call-parity/

Question 28 **Answer: A**

If, when the debt matures, the firm's assets are worth less than the face value owed, the shareholders default and in effect "put" the assets to the debtholders at a price equal to the face value of the debt. The debtholders have written this put, so their claim is worth the principal discounted at the risk-free rate less the value of the put; that put is the firm's credit (default) risk.

Why the other options are wrong

- **B.** The shareholders' residual claim can be viewed as a call on the firm's assets, but credit risk itself is the put the debtholders have written to the shareholders.
- **C.** The direction is wrong: shareholders hold the options (a call, or the assets plus a put); debtholders are the writers.

Key takeaway Debt = risk-free $PV(D)$ − put; equity = call on the assets with exercise price D.

Reading 78: Option Replication Using Put-Call Parity. Notes: credguild.com/cfa/level-1/notes/derivatives/put-call-parity/

Question 29 **Answer: A**

Put–call parity gives the put as the call minus the stock plus the present value of the exercise price, discounting the exercise price at the risk-free rate over the 6-month life.

$$p = c - S + X(1 + R_f)^{-T}$$

$PV(X) = 70.00/1.04^{0.5} = 70.00/1.019804 = 68.641$ $p = 6.20 - 73.00 + 68.641 = 1.841 \approx \$1.84$

Why the other options are wrong

- **B.** \$3.20 uses the undiscounted exercise price ($6.20 - 73.00 + 70.00$); parity requires $PV(X)$.
- **C.** \$10.56 reverses the signs, computing $c + S - PV(X) = 6.20 + 73.00 - 68.64$.

Key takeaway Always discount X over the option's remaining life in put–call parity.

Reading 78: Option Replication Using Put-Call Parity. Notes: credguild.com/cfa/level-1/notes/derivatives/put-call-parity/

Question 30 **Answer: B**

The hedge ratio equals the spread of the call's payoffs divided by the spread of the share prices. It is a ratio of payoffs, so no discounting or compounding at the risk-free rate is involved.

Call payoffs: $c_1^u = \max(0,\ 50 - 44) = 6$; $c_1^d = \max(0,\ 32 - 44) = 0$.

$$h = \frac{c_1^u - c_1^d}{S_1^u - S_1^d} = \frac{6 - 0}{50 - 32} = \frac{6}{18} = 0.333$$

Check: up-move value $= 0.333(50) - 6 = 10.67$; down-move value $= 0.333(32) - 0 = 10.67$. The portfolio of 0.333 shares per short call is worth 10.67 in both states.

Why the other options are wrong

- **A.** 0.32 divides the hedge ratio by 1.04 ($0.3333/1.04 = 0.3205$); the risk-free rate is used to value the portfolio and plays no part in computing h.
- **C.** 0.35 multiplies the hedge ratio by 1.04 ($0.3333 \times 1.04 = 0.3467$); again, h is not adjusted for interest.

Key takeaway $h = (c_1^u - c_1^d)/(S_1^u - S_1^d)$. The risk-free rate enters only when the certain portfolio value is discounted.

Reading 79: Valuing a Derivative Using a One-Period Binomial Model. Notes: credguild.com/cfa/level-1/notes/derivatives/binomial-option-pricing-model/

Question 31 **Answer: A**

Risk-neutral valuation weights the option's payoffs by the risk-neutral (pseudo-)probabilities and then discounts the expected payoff one period at the risk-free rate. The analyst's estimate of the actual probability of an up-move plays no role.

Payoffs at expiration: $c_1^u = \max(0,\ 78 - 65) = 13$; $c_1^d = \max(0,\ 51 - 65) = 0$.

Risk-neutral probabilities: $\pi_U = 0.40$, $\pi_D = 1 - 0.40 = 0.60$.

Expected payoff: $0.40(13) + 0.60(0) = 5.20$

$$c_0 = \frac{\pi_U\, c_1^u + \pi_D\, c_1^d}{1 + R_f} = \frac{5.20}{1.03} = 5.049 \approx \$5.05$$

Check with the hedge approach: $h = 13/(78 - 51) = 0.4815$; $V_1 = 0.4815(51) = 24.56$; $V_0 = 24.56/1.03 = 23.84$; $c_0 = 0.4815(60) - 23.84 = 5.05$. (The given probability is consistent with the tree: $(1.03 - 0.85)/(1.30 - 0.85) = 0.40$.)

Why the other options are wrong

- **B.** \$5.20 is the risk-neutral expected payoff 0.40×13 without discounting it one year at the risk-free rate.
- **C.** \$6.94 weights the payoff by the analyst's actual probability instead of the risk-neutral probability: $0.55 \times 13/1.03$.

Key takeaway Risk-neutral value = expected payoff using risk-neutral (not actual) probabilities, discounted at the risk-free rate.

Reading 79: Valuing a Derivative Using a One-Period Binomial Model. Notes: credguild.com/cfa/level-1/notes/derivatives/binomial-option-pricing-model/

Question 32 **Answer: C**

The hedge portfolio is worth $V_0 = hS_0 - c_0$, and because its end-of-period value is certain, V_0 is the present value of a riskless amount. Rearranged, $c_0 = hS_0 - V_0$: the call is equivalent to owning h shares while owing the riskless amount V_0, that is, buying the shares partly with money borrowed at the risk-free rate. This leveraged long position in the underlying has the same payoff as the call in both states: 4 after an up-move and 0 after a down-move in the illustration below.

Illustration. $S_0 = 30$; $S_1^u = 36$, $S_1^d = 25$; $X = 32$; risk-free rate 3% for the period.

$c_1^u = 4$, $c_1^d = 0$, so $h = 4/(36 - 25) = 0.3636$.

Riskless value of the hedge: $V_1 = 0.3636 \times 25 = 9.091$, so $V_0 = 9.091/1.03 = 8.826$.

$c_0 = 0.3636 \times 30 - 8.826 = 10.909 - 8.826 = 2.083$.

Replication: buy 0.3636 shares for 10.909 and borrow 8.826. Up-move: $0.3636 \times 36 - 9.091 = 4$. Down-move: $0.3636 \times 25 - 9.091 = 0$. These are the call's payoffs.

Why the other options are wrong

- **A.** Lending adds a riskless positive amount to the share position, so the portfolio would be worth more than the call after either move. In the hedge, $V_0 = hS_0 - c_0$ is the present value of a positive riskless amount, and $c_0 = hS_0 - V_0$ shows that the replicating portfolio owes that amount: it borrows.
- **B.** Short shares plus lending gains when the price falls. That combination replicates a put: $p_0 = V_0 - hS_0$.

Key takeaway In a one-period binomial model, a call can be replicated by buying h shares with partly borrowed money, and a put by selling h shares short and lending at the risk-free rate.

Reading 79: Valuing a Derivative Using a One-Period Binomial Model. Notes: credguild.com/cfa/level-1/notes/derivatives/binomial-option-pricing-model/

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