




### Question #1 of 4

Question ID: 1469227

We can use the risk-free rate to value an option with a one-period binomial model because:

- A) combining options with the underlying asset in a specific ratio will produce a risk-free future payment. 
- B) combining put and call options in specific ratio can produce a risk-free future payment. 
- C) options investors are risk-neutral, on average. 

#### Explanation

A portfolio of an option position and a position in the underlying asset can be constructed so that the portfolio value at option expiration is certain, the same for an up-move and for a down-move.




(Module 57.1, LOS 57.a)

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### Question #2 of 4

Question ID: 1469228

One method of valuing a call option with a one-period binomial model involves:

- A) finding a combination of the call option and the underlying that will have the same value regardless of the price of the underlying at expiration. 
- B) discounting the average call value at expiration by the risk-free rate. 
- C) using the probabilities of an up-move and a down-move to get the expected value of the payment at expiration. 

#### Explanation

A portfolio combining the call option with the underlying asset can be constructed that will have the same value at option expiration whether there is an up-move or a down move in the asset price. The present value of this portfolio is the discounted present value of the certain future payment, which can then be used to value the option. The expected value of the option at expiration is not a certain payment, so cannot be simply discounted at the risk-free rate. The average call value is not a certain future payment.




(Module 57.1, LOS 57.a)

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### Question #3 of 4

Question ID: 1469226

In order to value an option with a one-period binomial model, three things an analyst would need to know are:

- A) the probability of an up-move, the option exercise price, and the current asset price. 
- B) the risk-free rate, the volatility of the price of the underlying, and the current asset price. 
- C) the risk-adjusted discount rate, the volatility of the price of the underlying asset, and option exercise price. 

#### Explanation

The risk-free rate, the volatility of the price of the underlying, and the current asset price are three of the required variables needed to value an option with a one-period binomial model. The risk-adjusted rate of return and (actual) probability of an up-move are not required.

(Module 57.1, LOS 57.a)

### Question #4 of 4

Question ID: 1469229

Consider a stock that will have a value of either 22 or 14 one year from now. If the risk-free rate is 5%, what is the ratio of shares to short call options with an exercise price of 18 for a portfolio that will have the same value at expiration regardless of the stock price at the end of the year?

- A) 0.50. 
- B) 0.48. 
- C) 0.53. 

#### Explanation

With a stock price of 22 at expiration, the short call payoff is -4.

With a stock price of 14 at expiration, the call payoff is zero.

The appropriate hedge ratio is  $(4 - 0) / (22 - 14) = 0.5$ .

Portfolio value:  $0.5(22) - 4 = 0.5(14) = 7$

A portfolio of 0.5 shares of stock to 1 short call option will produce the same portfolio value whether the stock price at expiration is 22 or 14.

(Module 57.1, LOS 57.a)