1. List the four uses of derivatives.

   Risk management (hedging)
   Speculation (making a bet)
   Reduce transaction costs
   Regulatory arbitrage

2. There are three perspectives on derivatives. Please identify which perspective is represented by each party below. Each perspective will only be used once.

   Anderson Bank wants to protect itself from a potential change in interest rates. Therefore, Anderson Bank purchases an interest rate swap. Anderson Bank retains Raya Investment Bank to identify a counter party to take the interest rate risk. A professor at Purdue University decides to study this transaction to research the impact of interest rate swaps in reducing the interest rate risk experienced by banks.

   Anderson Bank represents this perspective: End user
   Raya Investment Bank represents this perspective: Intermediary
   The Purdue professor represents this perspective: Economic observers

3. The bid-ask prices on the stock of Hyland Corporation are 40.00 - 40.25.

   Jennifer purchases 200 shares of Hyland Corporation. The commissions on her purchase were 80.

   At the same time, Aiman is selling 200 shares of Hyland Corporation. Aiman’s commissions are 0.5% of the selling price.

   Calculate the total transaction costs incurred by Jennifer and Aiman combined.

   **Solution:**
   Aiman => (200)(40) – (0.005)(200)(40) = 7960
   Jennifer => (200)(40.25) + 80 = 8130
   Total transaction costs = 8130 – 7960 = 170
4. Malcolm buys 100 shares of the stock of Jiang Corporation at the same time that Ningzhu sells 100 shares of the stock of Jiang Corporation.

The commission on Malcolm's purchase is 0.50 per share while the commission on Ningzhu's sale is 1% of the price.

Malcolm pays 4150 to purchase his 100 shares.

The total transaction costs incurred by both Malcolm and Ningzhu are 130.60

Calculate the Bid Price for one share of Jiang Corporation.

**Solution:**

Let $A$ be the Ask Price. For Malcolm $100A + 0.5(100) = 4150 \rightarrow A = 41$

Let $X$ be the Bid Price. For Ningzhu $100X - 0.01(100X) = 99X$

$4150 - 99X = 130.60 \Rightarrow X = 40.6$

5. Ian wants to buy $X$ shares of Dakota Stock. Dakota stock has a bid price of 100 and a bid-ask spread of 1.

Ian can purchase the stock using either Bian Brokers or Simpson Stock Brokerage.

Bian charges a flat commission of 150 without regard to the number of shares purchased.

Simpson charges a commission that is 0.5% of the purchase price.

Determine the values of $X$ for which Ian should use Simpson.

**Solution:**

Ask=Bid + Bid Ask Spread = 101

Under Bian $\Rightarrow 101X + 150$

Under Simpson $\Rightarrow 101X + 0.005(101X) = 101.505X$

Now we set the two equal to each other and solve for $X$

$101X + 150 = 101.505X$ $\Rightarrow X = 297.03$

Therefore, Simpson will result in a lower cost if we buy 297 or less shares.
6. You sell 100 shares of the stock of Dummit Corporation short. The bid ask spread when you sell the stock is 35.00 to 35.25. At the time of the sale, you pay a commission of 1%.

Two months later, you cover your short position by buying 100 shares of stock of Dummit. At this time, the bid ask spread is 30.25 to 30.75. Once again, you pay a commission of 1%.

Calculate your profit on this transaction assuming there are no interest costs associated with the transaction.

Solution:

When you sell the stock short, you collect => 100(35) - .01(100)(35) = 3465

When you buy the stock later, you pay => 100(30.75) + .01(100)(30.75) = 3105.75

Profit = 3465 – 3105.75 = 359.25

7. Jordan short sells Hardwick Inc stock. The bid price for the stock was 50 and the ask price for the stock was 50.50. Jordan pays a commission which is 0.7%. The collateral is 100% of the cash collected after the commission.

The “haircut” is 50% of the stock price before commissions.

Determine the amount of collateral and the haircut.

Solution:

The amount collected when you sell one share of Hardwick is 50 – 50(0.007) = 49.65 = collateral

The haircut is just 50% of the stock price = 0.5(50) = 25

8. A crash of the financial markets is a diversifiable risk.

True or False

False. A crash of the financial markets is not diversifiable as the risk does not disappear as a result of diversification.
9. Circle any of the following that are NOT a derivative:

- The S&P 500 Index
- A Homeowner’s Insurance Policy
- The right to buy corn in six months for a price of $7 per bushel
- Apple Stock