1. (a) Find and write the definition of a “future”, also called a futures contract. Graph the intrinsic value of a futures contract at its contract date, or expiration date, as was done for the call option.

(b) Show that holding a call option and writing a put option on the same asset, with the same strike price $K$ is the same as having a futures contract on the asset with strike price $K$. Drawing a graph of the value of the combination and the value of the futures contract together with an explanation will demonstrate the equivalence.

2. Puts and calls are not the only option contracts available, just the most fundamental and the simplest. Puts and calls are designed to eliminate risk of up or down price movements in the underlying asset. Some other option contracts designed to eliminate other risks are created as combinations of puts and calls.

(a) Draw the graph of the value of the option contract composed of holding a put option with strike price $K_1$ and holding a call option with strike price $K_2$ where $K_1 < K_2$. (Assume both the put and the call have the same expiration date.) The investor profits only if the underlier moves dramatically in either direction. This is known as a long strangle.
(b) Draw the graph of the value of an option contract composed of holding a put option with strike price $K$ and holding a call option with the same strike price $K$. (Assume both the put and the call have the same expiration date.) This is called an **long straddle**, and also called a **bull straddle**.

(c) Draw the graph of the value of an option contract composed of holding one call option with strike price $K_1$ and the simultaneous writing of a call option with strike price $K_2$ with $K_1 < K_2$. (Assume both the options have the same expiration date.) This is known as a **bull call spread**.

(d) Draw the graph of the value of an option contract created by simultaneously holding one call option with strike price $K_1$, holding another call option with strike price $K_2$ where $K_1 < K_2$, and writing two call options at strike price $(K_1 + K_2)/2$. This is known as a **butterfly spread**.

(e) Draw the graph of the value of an option contract created by holding one put option with strike price $K$ and holding two call options on the same underlying security, strike price, and maturity date. This is known as a **triple option** or **strap**.

3. You would like to speculate on a rise in the price of a certain stock. The current stock price is $29 and a 3-month call with strike of $30 costs $2.90. You have $5,800 to invest. Identify two alternative strategies, one involving investment in the stock, and the other involving investment in the option. What are the potential gains and losses from each?

4. A company knows it is to receive a certain amount of foreign currency in 4 months. What type of option contract is appropriate for hedging? Please be very specific.

5. The current price of a stock is $94 and 3-month call options with a strike price of $95 currently sell for $4.70. An investor who feels that the price of the stock will increase is trying to decide between buying 100 shares and buying 2,000 call options. Both strategies involve an investment of $9,400. What advice would you give? How high does the stock price have to rise for the option strategy to be the more profitable?