

Quiz A: 8/2/16

Name Key

Note: Answer the following on a per-share basis.

Assume the following bid and ask prices for Apple stock and on puts and calls on Apple which have a strike price of \$105 and which expire 112 days from today. Assume also that the risk-free interest rate equals 1%.

	<u>Bid</u>	<u>Ask</u>
Stock	104.25	104.30
Call	4.30	4.40
Put	3.60	3.70

- a. Build a table that shows 1) the set of transactions today that will generate an arbitrage profit for you today, 2) your arbitrage profit today, 3) that 112 days from today, the individual payoffs from the transactions you made today add up to zero if Apple's stock price ends up at \$100 per share and 4) that 112 days from today, the individual payoffs from the transactions you made today add up to zero if Apple's stock price ends up at \$110 per share.
- b. Assume Apple's stock price ends up at \$100 per share 112 days from today. For each of the transactions you take today, list the transaction (or transactions) that occurs 112 days from today that generate the cash flows (even zeroes) shown in your table. Be sure to list the specific transaction or transactions (buy, sell, etc.), the price at which each transaction occurs, and the location of each transaction (market, you exercise an option, the buyer of the option exercises their option, etc.). Examples: "Buy XYZ in market for \$10" or "Exercise option to sell XYZ for \$10".

$$PV(K) = \frac{105}{(1.01)^{112/365}} = 104.68$$

$$S + P = C + PV(K) \quad (\text{short})$$

$$\text{Buy stock + put, Sell call + bond: } -104.30 - 3.70 + 4.3 + 104.68 = +0.98 \checkmark$$

$$\text{Short stock, sell put, buy call + bond: } +104.25 + 3.60 - 4.40 - 104.68 = -1.23 \times$$

<u>Trans</u>	<u>C₀</u>	<u>100</u>	<u>110</u>	<u>Trans</u>
+5 Buy stock	-104.30 +3	+100 +3	+110 +3	Sell stock in market for 100 +3
+5 Buy put	-3.70 +3	+5 +3	0 +3	(Buy stock in mkt for 100 +3
+5 Sell call	+4.30 +3	0 +3	-5 +3	Exercise put to sell stock for \$105 +3
+5 short bond	+104.68 +3	-105 +3	-105 +3	Not exercised +3
	+0.98 +4	0	0	Buy to cover bond in mkt for \$105 +3