Name:

6. Suppose the F_i in a long futures position are given as 150, 160, 155, 152, 150, 140, 138, 160. Make a table as in Ex. 2.2 in the lecture notes.

Day *i*	F_i	**Cash flow**	**Deposit at beginning of Day *i***	**Payment into account**	**Deposit at dnd of Day *i***
0	150	opening	0		
1	160				
2	155				
3	152				
4	150				
5	140				
6	138				
7	160				
8		closing			0

Total gain:

7. Suppose the F_i in a short futures position are given as 140, 130, 132, 135, 140, 130. Make a table as in Ex. 2.2 in the lecture notes.

Day i	F_i	Cash flow	Deposit at beginning of Day i	Payment into account	Deposit at dnd of Day i
0	140	opening	0		
1	130				
2	132				
3	135				
4	140				
5	130				
6		closing			0

Total gain:

8. An investor enters into two long July futures contracts on orange juice. Each contract is for the delivery of 15,000 pounds. The current futures price is 150 cents per pound, the initial margin is $6,000 per contract, and the maintenance margin is $4,000 per contract. What price change would lead to a margin call? Under what circumstances could $2,000 be withdrawn from the margin account?

The futures price must ○ increase ○ decrease

by ______ cents to trigger a margin call.

The futures price must ○ increase ○ decrease

by ______ cents to allow withdrawal of $2000.

9. An airline expects to purchase 3 million gallons of jet fuel in one month and decides to use heating oil futures for hedging. One futures contract is on 42,000 gallons. It is known that the standard deviations of the changes in the fuel price and in the futures price (per gallon) are \$0.735 and \$0.7, respectively, and the correlation coefficient between these two changes is 0.8. Find the optimal hedge ratio. What is the hedge that minimizes risk?

$h^* =$ ☐

The hedger should go ◯ long ◯ short

☐ futures contracts on heating oil.

10. A beer producer is commited to buy 200,000 pounds of wheat in one month. The only future available is a contract on 40,000 pounds of wheat with a maturity of two months. The values $\rho = 0.7$, $\sigma_S = 1.2$, and $\sigma_F = 1.4$ are known. Find the optimal hedge ratio. What is the hedge that minimizes risk?

$h^* =$ ______

The hedger should go ◯ long ◯ short

______ futures contracts on the wheat with maturity of two months.

11. The following table gives data on monthly changes in the spot price and the futures price for a certain commodity. Calculate the minimum variance hedge ratio.

ΔS	0.50	0.61	-0.22	-0.35	0.79	0.04	0.15	0.70	-0.51	-0.41
ΔF	0.56	0.63	-0.12	-0.44	0.60	-0.06	0.01	0.80	-0.56	-0.46

Using the variables n and x_i, y_i as in Ex. 3.7 of the lecture notes, we have:

$$n =$$

$$\sum_{i=1}^{n} x_i y_i =$$

$$\sum_{i=1}^{n} x_i =$$

$$\sum_{i=1}^{n} y_i =$$

$$\sum_{i=1}^{n} x_i^2 =$$

$$\sum_{i=1}^{n} y_i^2 =$$

$$\sigma_S =$$

$$\sigma_F =$$

$$\rho_{SF} =$$

$$h^* =$$

12. A company has a \$20 million portfolio with a beta of 1.1. It would like to use futures contracts on the S&P 500 to hedge its risk. The index is currently standing at 2,200, and each contract is for delivery of \$250 times the index. What is the hedge that minimizes risk?

The hedger should go ◯ long ◯ short

[ ] futures contracts on the S&P 500.