

# PAST EXAM Q'S

King Saud University  
Mathematics Department | ACTU461  
Exercise's Lecture (12)  
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1) Give the definition, the profit and the graph of a Cap  
When an investor should create a Cap?

2) Prove that:

$$\text{Profit [Cap]} = \text{Profit [Put]}$$

3) A stock has a current value of 51. A 3-month 50-strike call can be purchased for 3.14, and a 3-month 50-strike put can be purchased for 1.15. An investor sells the index short for replacement in three months and buys a 50-strike call. The risk-free rate is 8%.

a) What is the name of the investor's strategy?

b) Find the maximum value of this profit.

The current value of an S&R index is 1000 and the index has no dividends. You are given the following information about options prices on this index:

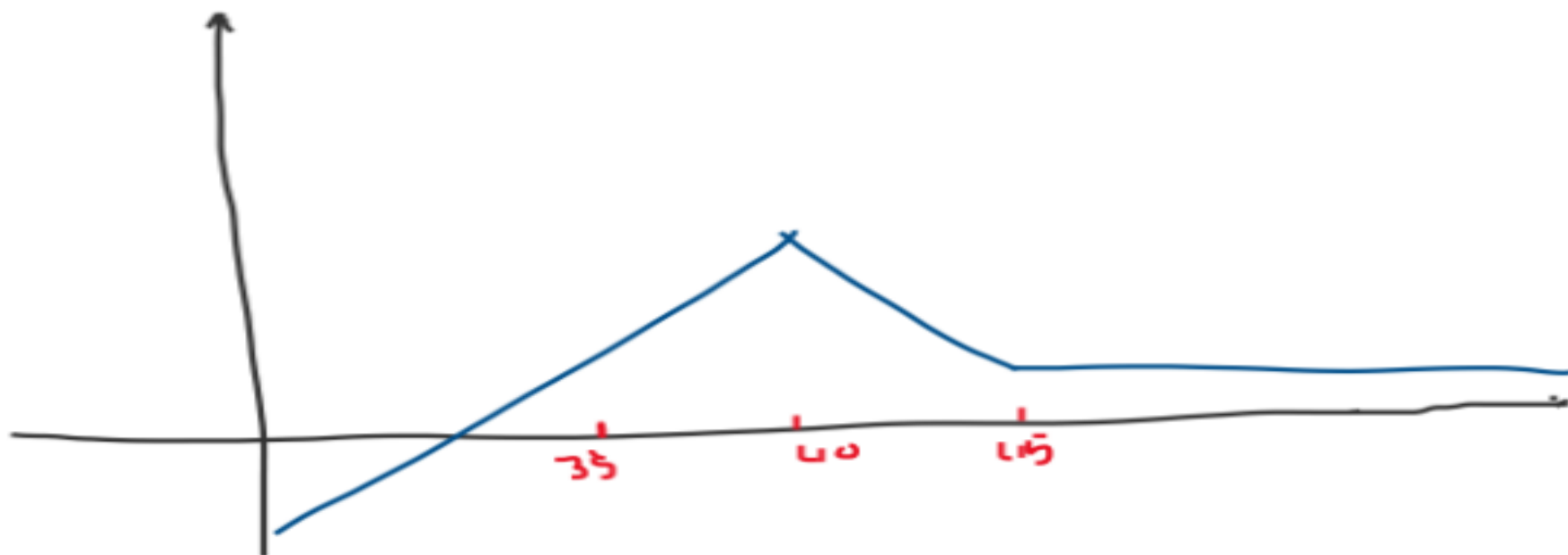
<b>Strike</b>	<b>Call Price</b>	<b>Put Price</b>
975	77.716	43.015
1000	64.595	
1025	53.115	67.916

- 1) Find the continuously compounded annual interest rate  $r$
- 2) Find the put price for  $K=1000$
- 3) What is the premium of a long forward contract with a forward price 975?
- 4) Investor A buys the index at time 0 and buys a 975-put with  $T=0.25$ . What is his minimum profit (loss)?
- 5) Investor B buys a 975-strike call and sells a 1025-strike call. What is his maximum profit?
- 6) Investor C buys the index, buys a 975-strike put and sells a 1025-strike call. What is his maximum profit?
- 7) Investor D buys a 975-strike put and 975-strike call. What is his maximum profit?

- 1) Give the definition, the profit and the graph of a collared stock strategy.
- 2) Give the definition, the profit and the graph of a bull spread strategy.
- 3) Prove that:

$$\text{Profit [Collared Stock]} = \text{Profit [Bull Spread]}$$

Which of the following choices could have a profit graph of the form given below:



- A) Sell a call and a put with  $K=40$  and buy a put with  $K=35$  and a call with  $K=45$ .
- B) Buy a call and a put with  $K=40$  and sell a put with  $K=35$  and a call with  $K=45$ .
- C) Buy a straddle.
- D) Buy a call and a put with  $K=40$  and sell a put with  $K=35$
- E) Sell a call and a put with  $K=40$  and buy a call with  $K=45$

- a) You short an index at  $S_0$  and write a put on this index.  
Give the name of your combined position, the reason to write a put with index and an equivalent strategy profit (with the proof).
- b) You short an index and you write a 6-months 100-strike put on this index. Suppose that 100-strike call on this index costs 4 and the risk-free effective interest rate is 2%. What is the profit of your combined position if the index price at expiration is 120?