# EXAM FM QUESTIONS OF THE WEEK

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## Week of October 8/07

An investor writes a call option at the same time as purchasing a put option. Both are European options and both options have a strike price of $23 and expire in one year. The annual effective risk free rate of interest is 5%. The call option premium is $2.45 and the put option premium is $4.36. Find the range of stock prices at the end of the year that result in a positive profit.

**The solution can be found below.**

## Week of October 8/07 - Solution

The profit on the written call is

$$\begin{cases} 2.45(1.05) & \text{if } S_1 \leq 23 \text{ (option is not exercised)} \\ 23 + 2.45(1.05) - S_1 & \text{if } S_1 > 23 \text{ (option is exercised)} \end{cases}$$

The profit on the purchased put is

$$\begin{cases} 23 - S_1 - 4.36(1.05) & \text{if } S_1 \leq 23 \text{ (option is exercised)} \\ -4.36(1.05) & \text{if } S_1 > 23 \text{ (option is not exercised)} \end{cases}$$

The combined profit is $21 - S_1$ for all values of $S_1$ .

There will be a positive profit if $S_1 < 21$ .