

UNIVERSITY OF TEXAS AT AUSTIN

Quiz #12

Properties of option prices. Spreads. Strangles.

Provide your **final answer only** to the following problem(s):**Problem 12.1.** (5 points) We are given the following European-call prices for options on the same underlying asset:

\$50-strike	\$11
\$55-strike	\$6
\$60-strike	\$4

Assume that the continuously compounded interest rate is strictly positive. Which of the following portfolios would exploit an arbitrage opportunity stemming from the above stock prices?

- (a) The call bull spread only.
- (b) The call bear spread only.
- (c) Both the call bull and the call bear spread.
- (d) Neither the call bull or call bear spread, but there is an arbitrage opportunity.
- (e) There is no apparent arbitrage opportunity.

Solution: (b)**Problem 12.2.** (2 points) The payoff of the call bull spread is equal to the payoff of the put bull spread. *True or false?***Solution:** FALSE

It's the profits that are equal.

Problem 12.3. (2 points) A butterfly spread can be constructed in this way:Buy a 90 call, sell a 100 put, sell a 100 call, buy a 110 put.*True or false?***Solution:** TRUE**Problem 12.4.** (2 pts) In our usual notation, we **always** have that

$$V_C(t) > S(t) - Ke^{-r(T-t)}$$

for every $t \in [0, T]$ regardless of whether the stock pays dividends or not. *True or false?***Solution:** FALSE**Problem 12.5.** (5 points) An investor buys a two-year (\$800, \$900)-strangle on gold. The price of gold two years from now is modeled using the following distribution:

\$750,	with probability 0.45,
\$850,	with probability 0.4,
\$925,	with probability 0.15.

What is the investor's expected payoff?

- (a) About \$23.25
- (b) About \$25.00
- (c) About \$26.25
- (d) About \$37.50
- (e) None of the above.

Solution: (c)

$$50 \times 0.45 + 25 \times 0.15 = 26.25.$$