

UNIVERSITY OF TEXAS AT AUSTIN

Quiz #17

Properties of option prices. Spreads. Strangles.

Provide your **final answer only** to the following problem(s):

Problem 17.1. (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.

Problem 17.2. (2 points) The payoff of the call bull spread is equal to the payoff of the put bull spread. *True or false?*

Problem 17.3. (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?

Problem 17.4. (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?*

Problem 17.5. (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.