

MATH 497 - Additional Questions for Homework on Section 1.5.

A. Let $S(0) = 75$, $S(1) = \begin{cases} 84 & \text{if stock is up (probability 0.5)} \\ 72 & \text{if stock is down (probability 0.5)} \end{cases}$. Suppose one enters a long forward contract with delivery date $T = 1$ and forward price $F = 76.5$. What would be value of this forward contract at the delivery date? What would be the expected value of the forward contract at the delivery date?

B. Let $A(t)$ and $S(t)$ denote the value of a risk-free bond and a share of stock, respectively, at time t . Let $A(0) = 10$, $A(T) = 10.5$, $S(0) = 60$, and $S(T) = \begin{cases} 68 & \text{if market is up (probability 0.3)} \\ 62 & \text{if market is middling (probability 0.5)} \\ 57 & \text{if market is down (probability 0.2)} \end{cases}$.

(a) Assuming no arbitrage opportunity exists, what would be the forward price for a forward contract for a share of stock with delivery date T ?

(b) What would be the value and expected value of a long forward contract (of the type described in part a) at the delivery date?

(c) What would be the value and expected value of a short forward contract (of the type described in part a) at the delivery date?