HW 7.3 (b) Key

1. A stock has a current price of \$85. A dividend of \$4.25 is expected to be paid in 3 months. The risk-free interest rate is 5.5% effective per annum. X is the forward price of a one-year forward contract that has the stock as the underlying asset. Determine X. [18 #03]

[A] \$85.25 B) \$81.84 C) \$83.55 D) \$86.96 E) \$88.66

$$F = FV(S_0) - FV(Div)$$

$$= 85(1.055) - 4.25(1.055)^{0.75}$$

$$= \boxed{85.25}$$

2. The current price of a stock is \$116. The stock is expected to pay dividends continuously at a constant annual rate of 3.5%. The risk-free force of interest is 6.5% per annum. X is the forward price of a 1.5-year forward contract. Determine X. [18 #04]

[A] \$121.34 B) \$116.49 C) \$118.91 D) \$123.77 E) \$126.19

$$F = S_0 e^{(r-\delta)t} = 116 e^{0.03(1.5)} = \boxed{121.34}$$

3. A stock has a current spot price of \$90, and a nine-month forward price of \$95. The continuously compounded annual interest rate is 10%. Find the stock's annualized continuous dividend yield which is consistent with this forward price. [18 #09]

[A] 2.79% B) 2.46% C) 2.54% D) 2.62% E) 2.71%

$$F = S_0 e^{(r-\delta)t}$$

$$95 = 90 e^{(0.1-\delta)0.75}$$

$$95 = 90 e^{0.075} e^{-0.75\delta}$$

$$\delta = \boxed{2.79\%}$$

4. Consider the following information for an index:

   * The index spot price is 750.
   * The continuously compounded risk-free rate is 6.8%.
   * The 6-month forward price is 761.33.

   Solve for the implied dividend yield.

   [A] 3.8% B) 3.2% C) 3.4% D) 3.6% E) 4.0%

$$F = S_0 e^{(r-\delta)t}$$

$$761.33 = 750e^{(0.068-\delta)(0.5)}$$

$$761.33 = 750\, e^{0.034}\, e^{-0.5\delta}$$

$$\delta = \boxed{3.8\%}$$

5. The price for one share of Stock Z was \$88 on January 1, 2014.

   Stock Z will pay dividends of \$2.40 every 3 months for the next year (i.e. on April 1, 2014; July 1, 2014; October 1, 2014; and January 1, 2015).

   The quarterly effective interest rate is 1.1%.

   What is the forward price for one share of Stock Z to be paid immediately after the January 1, 2015 dividend?

   [A] \$82.18 B) \$83.82 C) \$85.46 D) \$87.11 E) \$88.75

$$F = FV(S_0) - FV(Div)$$

$$= 88(1+j)^4 - 2.4(1+j)^3 - 2.4(1+j)^2 - 2.4(1+j) - 2.4$$

$$= \boxed{88.18}$$