Chapter 10  
Solutions to Questions and Problems

1.  \( R = .1133 \) or 11.33%

2.  Dividend yield = .0169 or 1.69%  
    Capital gains yield = .0964 or 9.64%

3.  \( R = -.0675 \) or −6.75%  
    Dividend yield = .0169 or 1.69%  
    Capital gains yield = -.0843 or −8.43%

4.A.  Total dollar return = $44  
      The total percentage return of the bond is:  
      \( R = .0393 \) or 3.93%

7.  \[
\bar{X} = \frac{\sum_{i=1}^{N} x_i}{N} = \frac{[11 + .06 - .08 + .28 + .13]}{5} = .1000 \text{ or } 10.00\%
\]

\[
\bar{Y} = \frac{\sum_{i=1}^{N} y_i}{N} = \frac{[.36 - .07 + .21 - .12 + .43]}{5} = .1620 \text{ or } 16.20\%
\]

\[
s_X^2 = \frac{1}{N-1} \left( \sum_{i=1}^{N} (x_i - \bar{x})^2 \right)
\]

\[
s_X^2 = \frac{1}{5-1} \left( (.11 - .100)^2 + (.06 - .100)^2 + (-.08 - .100)^2 + (.28 - .100)^2 + (.13 - .100)^2 \right) = .016850
\]

\[
s_Y^2 = \frac{1}{5-1} \left( (.36 - .162)^2 + (-.07 - .162)^2 + (.21 - .162)^2 + (-.12 - .162)^2 + (.43 - .162)^2 \right) = .061670
\]

The standard deviation is the square root of the variance, so the standard deviation of each stock is:  
\( s_X = .1298 \) or 12.98%  
\( s_Y = .2483 \) or 24.83%
8. 
   a. Large company stock average return = 3.24%
      T-bills average return = 6.55%
   b. Variance = 0.058136
      Standard deviation = 0.2411 or 24.11%
      Using the equation for variance, we find the variance for T-bills over this period was:
      Variance = 0.000153
      Standard deviation = 0.0124 or 1.24%
   c. Average observed risk premium = –3.32%
      Variance = 0.062078
      Standard deviation = 0.2440 or 24.40%
   d. Before the fact, for most assets the risk premium will be positive; investors demand
      compensation over and above the risk-free return to invest their money in the risky
      asset. After the fact, the observed risk premium can be negative if the asset’s nominal
      return is unexpectedly low, the risk-free return is unexpectedly high, or if some
      combination of these two events occurs.

9. 
   a. Arithmetic average return = .0880 or 8.80%
   b. Variance = 0.023570
      Standard deviation = 0.1535 or 15.35%

10. 
    a. \( \bar{r} = .0441 \) or 4.41%
    b. \( \bar{RP} = .0370 \) or 3.70%

11. \( r_f = .0086 \) or 0.86%
    And to calculate the average real risk premium, we can subtract the average risk-free rate
    from the average real return. So, the average real risk premium was:
        \( \bar{rp} = .0355 \) or 3.55%

13. \( P_t = \$163.51 \)
    There are no intermediate cash flows on a zero coupon bond, so the return is the capital
    gains, or:
        \( R = .0731 \) or 7.31%

14. \( R = .0137 \) or 1.37%
15. \( R = 0.0872 \) or 8.72%
    APR = 34.88%
    EAR = 0.3971 or 39.71%

19. \( R = 0.38 \) or 38%
    Variance = 0.049050
    Standard deviation = 0.2215 or 22.15%

20. Arithmetic average return = 0.0883 or 8.83%
    Geometric average return = 0.0769 or 7.69%

21. The return for each year is:
    \( R_1 = 0.1507 \) or 15.07%
    \( R_2 = 0.0554 \) or 5.54%
    \( R_3 = -0.0649 \) or -6.49%
    \( R_4 = 0.2026 \) or 20.26%
    \( R_5 = 0.2127 \) or 21.27%

    \( R_A = 0.1113 \) or 11.13%
    \( R_G = 0.1062 \) or 10.62%

23. \( P_1 = 1,047.67 \)
    \( R = 0.0964 \) or 9.64%

    And using the Fisher equation to find the real return, we get:
    \( r = 0.0462 \) or 4.62%