CHAPTER 8
STOCKS AND THEIR VALUATION

(Difficulty: E = Easy, M = Medium, and T = Tough)

Multiple Choice: Conceptual

Easy:

Required return   **Answer: e Diff: E**

1.   An increase in a firm's expected growth rate would normally cause the firm's required rate of return to

   a. Increase.
   b. Decrease.
   c. Fluctuate.
   d. Remain constant.
   e. Possibly increase, possibly decrease, or possibly remain unchanged.

Required return   **Answer: d Diff: E**

2.   If the expected rate of return on a stock exceeds the required rate,

   a. The stock is experiencing supernormal growth.
   b. The stock should be sold.
   c. The company is probably not trying to maximize price per share.
   d. The stock is a good buy.
   e. Dividends are not being declared.

Required return   **Answer: a Diff: E**

3.   Stock A has a required return of 10 percent. Its dividend is expected to grow at a constant rate of 7 percent per year. Stock B has a required return of 12 percent. Its dividend is expected to grow at a constant rate of 9 percent per year. Stock A has a price of $25 per share, while Stock B has a price of $40 per share. Which of the following statements is most correct?

   a. The two stocks have the same dividend yield.
   b. If the stock market were efficient, these two stocks should have the same price.
   c. If the stock market were efficient, these two stocks should have the same expected return.
   d. Statements a and c are correct.
   e. All of the statements above are correct.

Constant growth model   **Answer: a   Diff: E**

4.   Which of the following statements is most correct?

    a. The constant growth model takes into consideration the capital gains earned on a stock.
    b. It is appropriate to use the constant growth model to estimate stock value even if the growth rate never becomes constant.
    c. Two firms with the same dividend and growth rate must also have the same stock price.
    d. Statements a and c are correct.
    e. All of the statements above are correct.

Constant growth model   **Answer: a   Diff: E**

5.   Which of the following statements is most correct?

    a. The stock valuation model, $P_0 = D_1/(k_s - g)$, can be used for firms which have negative growth rates.
    b. If a stock has a required rate of return k_s = 12 percent, and its dividend grows at a constant rate of 5 percent, this implies that the stock's dividend yield is 5 percent.
    c. The price of a stock is the present value of all expected future dividends, discounted at the dividend growth rate.
    d. Statements a and c are correct.
    e. All of the statements above are correct.

Constant growth model   **Answer: c   Diff: E**

6.   A stock's dividend is expected to grow at a constant rate of 5 percent a year. Which of the following statements is most correct?

    a. The expected return on the stock is 5 percent a year.
    b. The stock's dividend yield is 5 percent.
    c. The stock's price one year from now is expected to be 5 percent higher.
    d. Statements a and c are correct.
    e. All of the statements above are correct.

Constant growth model   **Answer: e   Diff: E**

7.   Stocks A and B have the same required rate of return and the same expected year-end dividend (D_1). Stock A's dividend is expected to grow at a constant rate of 10 percent per year, while Stock B's dividend is expected to grow at a constant rate of 5 percent per year. Which of the following statements is most correct?

    a. The two stocks should sell at the same price.
    b. Stock A has a higher dividend yield than Stock B.
    c. Currently Stock B has a higher price, but over time Stock A will eventually have a higher price.
    d. Statements b and c are correct.
    e. None of the statements above is correct.

Constant growth stock **Answer: c Diff: E N**

8. Stock X and Stock Y sell for the same price in today's market. Stock X has a required return of 12 percent. Stock Y has a required return of 10 percent. Stock X's dividend is expected to grow at a constant rate of 6 percent a year, while Stock Y's dividend is expected to grow at a constant rate of 4 percent. Assume that the market is in equilibrium and expected returns equal required returns. Which of the following statements is most correct?

    a. Stock X has a higher dividend yield than Stock Y.
    b. Stock Y has a higher dividend yield than Stock X.
    c. One year from now, Stock X's price is expected to be higher than Stock Y's price.
    d. Statements a and c are correct.
    e. Statements b and c are correct.

Constant growth stock **Answer: e Diff: E N**

9. Stock X is expected to pay a dividend of $3.00 at the end of the year (that is, $D_1 = \$3.00$). The dividend is expected to grow at a constant rate of 6 percent a year. The stock currently trades at a price of $50 a share. Assume that the stock is in equilibrium, that is, the stock's price equals its intrinsic value. Which of the following statements is most correct?

    a. The required return on the stock is 12 percent.
    b. The stock's expected price 10 years from now is $89.54.
    c. The stock's dividend yield is 6 percent.
    d. Statements a and b are correct.
    e. All of the statements above are correct.

Constant growth model **Answer: e Diff: E**

10. Stock X has a required return of 12 percent, a dividend yield of 5 percent, and its dividend will grow at a constant rate forever. Stock Y has a required return of 10 percent, a dividend yield of 3 percent, and its dividend will grow at a constant rate forever. Both stocks currently sell for $25 per share. Which of the following statements is most correct?

    a. Stock X pays a higher dividend per share than Stock Y.
    b. Stock X has a lower expected growth rate than Stock Y.
    c. One year from now, the two stocks are expected to trade at the same price.
    d. Statements a and b are correct.
    e. Statements a and c are correct.

Constant growth model and CAPM   **Answer: a Diff: E N**

11.   Stock A has a beta of 1.1, while Stock B has a beta of 0.9. The market risk premium, $k_M - k_{RF}$, is 6 percent. The risk-free rate is 6.3 percent. Both stocks have a dividend, which is expected to grow at a constant rate of 7 percent a year. Assume that the market is in equilibrium. Which of the following statements is most correct?

   a. Stock A must have a higher dividend yield than Stock B.
   b. Stock A must have a higher stock price than Stock B.
   c. Stock B's dividend yield equals its expected dividend growth rate.
   d. Statements a and c are correct.
   e. All of the statements above are correct.

Miscellaneous issues   **Answer: c Diff: E**

12.   Which of the following statements is most correct?

   a. If a company has two classes of common stock, Class A and Class B, the stocks may pay different dividends, but the two classes must have the same voting rights.
   b. An IPO occurs whenever a company buys back its stock on the open market.
   c. The preemptive right is a provision in the corporate charter that gives common stockholders the right to purchase (on a pro rata basis) new issues of common stock.
   d. Statements a and b are correct.
   e. Statements a and c are correct.

Preemptive right   **Answer: b Diff: E**

13.   The preemptive right is important to shareholders because it

   a. Allows management to sell additional shares below the current market price.
   b. Protects the current shareholders against dilution of ownership interests.
   c. Is included in every corporate charter.
   d. Will result in higher dividends per share.
   e. The preemptive right is not important to shareholders.

Classified stock   **Answer: e Diff: E**

14.   Companies can issue different classes of common stock. Which of the following statements concerning stock classes is most correct?

   a. All common stocks fall into one of three classes: A, B, and C.
   b. Most firms have several classes of common stock outstanding.
   c. All common stock, regardless of class, must have voting rights.
   d. All common stock, regardless of class, must have the same dividend privileges.
   e. None of the statements above is necessarily true.

Efficient markets hypothesis   **Answer: e Diff: E**

15.   Which of the following statements is most correct?

       a. If a market is strong-form efficient this implies that the returns on
          bonds and stocks should be identical.
       b. If a market is weak-form efficient this implies that all public
          information is rapidly incorporated into market prices.
       c. If your uncle earns a return higher than the overall stock market, this
          means the stock market is inefficient.
       d. Statements a and b are correct.
       e. None of the above statements is correct.

Efficient markets hypothesis   **Answer: d Diff: E**

16.   Assume that the stock market is semistrong-form efficient. Which of the
       following statements is most correct?

       a. Stocks and bonds should have the same expected returns.
       b. In equilibrium all stocks should have the same expected returns, but
          returns on stocks should exceed returns on bonds.
       c. You can expect to outperform the overall market by observing the past
          price history of an individual stock.
       d. For the average investor, the expected net present value from investing
          in the stock market is zero.
       e. For the average investor, the expected net present value from investing
          in the stock market is the required return on the stock.

Efficient markets hypothesis   **Answer: e Diff: E**

17.   Assume that the stock market is semistrong-form efficient. Which of the
       following statements is most correct?

       a. The required rates of return on all stocks are the same and the
          required rates of return on stocks are higher than the required rates
          of return on bonds.
       b. The required rates of return on stocks equal the required rates of
          return on bonds.
       c. A trading strategy in which you buy stocks that have recently fallen in
          price is likely to provide you with returns that exceed the rate of
          return on the overall stock market.
       d. Statements a and c are correct.
       e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: e Diff: E**

18.   Which of the following statements is most correct?

       a. If the stock market is weak-form efficient, then information about
          recent trends in stock prices would be very useful when it comes to
          selecting stocks.
       b. If the stock market is semistrong-form efficient, stocks and bonds
          should have the same expected return.
       c. If the stock market is semistrong-form efficient, all stocks should
          have the same expected return.
       d. Statements a and c are correct.
       e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: c Diff: E**

19. Which of the following statements is most correct?

    a. Semistrong-form market efficiency implies that all private and public information is rapidly incorporated into stock prices.
    b. Market efficiency implies that all stocks should have the same expected return.
    c. Weak-form market efficiency implies that recent trends in stock prices would be of no use in selecting stocks.
    d. All of the statements above are correct.
    e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: a Diff: E**

20. Which of the following statements is most correct?

    a. Semistrong-form market efficiency means that stock prices reflect all public information.
    b. An individual who has information about past stock prices should be able to profit from this information in a weak-form efficient market.
    c. An individual who has inside information about a publicly traded company should be able to profit from this information in a strong-form efficient market.
    d. Statements a and c are correct.
    e. All the statements above are correct.

Efficient markets hypothesis   **Answer: e Diff: E N**

21. Which of the following statements is most correct?

    a. If a market is weak-form efficient, this means that prices rapidly reflect all available public information.
    b. If a market is weak-form efficient, this means that you can expect to beat the market by using technical analysis that relies on the charting of past prices.
    c. If a market is strong-form efficient, this means that all stocks should have the same expected return.
    d. All of the statements above are correct.
    e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: a Diff: E**

22. Most studies of stock market efficiency suggest that the stock market is highly efficient in the weak form and reasonably efficient in the semistrong form. On the basis of these findings which of the following statements is correct?

    a. Information you read in *The Wall Street Journal* today cannot be used to select stocks that will consistently beat the market.
    b. The stock price for a company has been increasing for the past 6 months. On the basis of this information it must be true that the stock price will also increase during the current month.
    c. Information disclosed in companies' most recent annual reports can be used to consistently beat the market.
    d. Statements a and c are correct.
    e. All of the statements above are correct.

Preferred stock concepts **Answer: e Diff: E**

23. Which of the following statements is most correct?

    a. Preferred stockholders have priority over common stockholders.
    b. A big advantage of preferred stock is that preferred stock dividends are tax deductible for the issuing corporation.
    c. Most preferred stock is owned by corporations.
    d. Statements a and b are correct.
    e. Statements a and c are correct.

Preferred stock concepts **Answer: e Diff: E**

24. Which of the following statements is most correct?

    a. One of the advantages to the firm associated with preferred stock financing rather than common stock financing is that control of the firm is not diluted.
    b. Preferred stock provides steadier and more reliable income to investors than common stock.
    c. One of the advantages to the firm of financing with preferred stock is that 70 percent of the dividends paid out are tax deductible.
    d. Statements a and c are correct.
    e. Statements a and b are correct.

Common stock concepts **Answer: d Diff: E**

25. Which of the following statements is most correct?

    a. One of the advantages of common stock financing is that a greater proportion of stock in the capital structure can reduce the risk of a takeover bid.
    b. A firm with classified stock can pay different dividends to each class of shares.
    c. One of the advantages of common stock financing is that a firm's debt ratio will decrease.
    d. Statements b and c are correct.
    e. All of the statements above are correct.

Common stock concepts **Answer: e Diff: E**

26. Stock X has a required return of 10 percent, while Stock Y has a required return of 12 percent. Which of the following statements is most correct?

    a. Stock Y must have a higher dividend yield than Stock X.
    b. If Stock Y and Stock X have the same dividend yield, then Stock Y must have a lower expected capital gains yield than Stock X.
    c. If Stock X and Stock Y have the same current dividend and the same expected dividend growth rate, then Stock Y must sell for a higher price.
    d. All of the statements above are correct.
    e. None of the statements above is correct.

Declining growth stock   **Answer: e Diff: E**

27. A stock expects to pay a year-end dividend of $2.00 a share ($D_1 = \$2.00$). The dividend is expected to fall 5 percent a year, forever ($g = -5\%$). The company's expected and required rate of return is 15 percent. Which of the following statements is most correct?

    a. The company's stock price is $10.
    b. The company's expected dividend yield 5 years from now will be 20 percent.
    c. The company's stock price 5 years from now is expected to be $7.74.
    d. Statements b and c are correct.
    e. All of the statements above are correct.

Dividend yield and g   **Answer: d Diff: E**

28. If two constant growth stocks have the same required rate of return and the same price, which of the following statements is most correct?

    a. The two stocks have the same per-share dividend.
    b. The two stocks have the same dividend yield.
    c. The two stocks have the same dividend growth rate.
    d. The stock with the higher dividend yield will have a lower dividend growth rate.
    e. The stock with the higher dividend yield will have a higher dividend growth rate.

Dividend yield and g   **Answer: c Diff: E**

29. Stocks A and B have the same price, but Stock A has a higher required rate of return than Stock B. Which of the following statements is most correct?

    a. Stock A must have a higher dividend yield than Stock B.
    b. Stock B must have a higher dividend yield than Stock A.
    c. If Stock A has a lower dividend yield than Stock B, its expected capital gains yield must be higher than Stock B's.
    d. If Stock A has a higher dividend yield than Stock B, its expected capital gains yield must be lower than Stock B's.
    e. Stock A must have both a higher dividend yield and a higher capital gains yield than Stock B.

Market equilibrium   **Answer: b Diff: E N**

30. If markets are in equilibrium, which of the following will occur:

    a. Each investment's expected return should equal its realized return.
    b. Each investment's expected return should equal its required return.
    c. Each investment should have the same expected return.
    d. Each investment should have the same realized return.
    e. All of the statements above are correct.

Medium:

Market efficiency and stock returns   **Answer: c Diff: M**

31.   Which of the following statements is most correct?

      a. If a stock's beta increased but its growth rate remained the same, then
         the new equilibrium price of the stock will be higher (assuming
         dividends continue to grow at the constant growth rate).
      b. Market efficiency says that the actual realized returns on all stocks
         will be equal to the expected rates of return.
      c. An implication of the semistrong form of the efficient markets
         hypothesis is that you cannot consistently benefit from trading on
         information reported in *The Wall Street Journal*.
      d. Statements a and b are correct.
      e. All of the statements above are correct.

Efficient markets hypothesis   **Answer: e Diff: M**

32.   Which of the following statements is most correct?

      a. If the stock market is weak-form efficient this means you cannot use
         private information to outperform the market.
      b. If the stock market is semistrong-form efficient, this means the
         expected return on stocks and bonds should be the same.
      c. If the stock market is semistrong-form efficient, this means that high-
         beta stocks should have the same expected return as low-beta stocks.
      d. Statements b and c are correct.
      e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: c Diff: M**

33.   If the stock market is semistrong-form efficient, which of the following
      statements is most correct?

      a. All stocks should have the same expected returns; however, they may
         have different realized returns.
      b. In equilibrium, stocks and bonds should have the same expected returns.
      c. Investors can outperform the market if they have access to information
         that has not yet been publicly revealed.
      d. If the stock market has been performing strongly over the past several
         months, stock prices are more likely to decline than increase over the
         next several months.
      e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: e Diff: M**

34.   Assume that markets are semistrong-form efficient. Which of the following
      statements is most correct?

      a. All stocks should have the same expected return.
      b. All stocks should have the same realized return.
      c. Past stock prices can be successfully used to forecast future stock
         returns.
      d. Statements a and c are correct.
      e. None of the statements above is correct.

Efficient markets hypothesis   **Answer: d Diff: M**

35. Assume that markets are semistrong-form efficient, but not strong-form
     efficient. Which of the following statements is most correct?

     a. Each common stock has an expected return equal to that of the overall
        market.
     b. Bonds and stocks have the same expected return.
     c. Investors can expect to earn returns above those predicted by the SML
        if they have access to public information.
     d. Investors may be able to earn returns above those predicted by the SML
        if they have access to information that has not been publicly revealed.
     e. Statements b and c are correct.

Market equilibrium   **Answer: a Diff: M**

36. For markets to be in equilibrium, that is, for there to be no strong
     pressure for prices to depart from their current levels,

     a. The expected rate of return must be equal to the required rate of
        return; that is, $\hat{k}$ = k.
     b. The past realized rate of return must be equal to the expected rate of
        return; that is, $\overline{k}$ = $\hat{k}$.
     c. The required rate of return must equal the realized rate of return;
        that is, k = $\overline{k}$.
     d. All three of the statements above must hold for equilibrium to exist;
        that is, $\hat{k}$ = k = $\overline{k}$.
     e. None of the statements above is correct.

Ownership and going public   **Answer: c Diff: M**

37. Which of the following statements is false?

     a. When a corporation's shares are owned by a few individuals who are
        associated with or are the firm's management, we say that the firm is
        "closely held."
     b. A publicly owned corporation is simply a company whose shares are held
        by the investing public, which may include other corporations and
        institutions as well as individuals.
     c. Going public establishes a true market value for the firm and ensures
        that a liquid market will always exist for the firm's shares.
     d. When stock in a closely held corporation is offered to the public for
        the first time the transaction is called "going public" and the market
        for such stock is called the new issue market.
     e. It is possible for a firm to go public, and yet not raise any
        additional new capital.

Dividend yield and g   **Answer: b Diff: M**

38.   Which of the following statements is most correct?

      a. Assume that the required rate of return on a given stock is 13 percent.
         If the stock's dividend is growing at a constant rate of 5 percent, its
         expected dividend yield is 5 percent as well.
      b. The dividend yield on a stock is equal to the expected return less the
         expected capital gain.
      c. A stock's dividend yield can never exceed the expected growth rate.
      d. Statements b and c are correct.
      e. All of the statements above are correct.

Constant growth model   **Answer: d Diff: M**

39.   The expected rate of return on the common stock of Northwest Corporation is
      14 percent. The stock's dividend is expected to grow at a constant rate of
      8 percent a year. The stock currently sells for $50 a share. Which of the
      following statements is most correct?

      a. The stock's dividend yield is 8 percent.
      b. The stock's dividend yield is 7 percent.
      c. The current dividend per share is $4.00.
      d. The stock price is expected to be $54 a share in one year.
      e. The stock price is expected to be $57 a share in one year.

Multiple Choice: Problems

Easy:

Preferred stock value   **Answer: d Diff: E**

40.   The Jones Company has decided to undertake a large project. Consequently,
      there is a need for additional funds. The financial manager plans to issue
      preferred stock with a perpetual annual dividend of $5 per share and a par
      value of $30.   If the required return on this stock is currently 20
      percent, what should be the stock's market value?

      a. $150
      b. $100
      c. $ 50
      d. $ 25
      e. $ 10

Preferred stock value   **Answer: d Diff: E**

41.   Johnston Corporation is growing at a constant rate of 6 percent per year.
      It has both common stock and non-participating preferred stock outstanding.
      The cost of preferred stock (k_p) is 8 percent.   The par value of the
      preferred stock is $120, and the stock has a stated dividend of 10 percent
      of par. What is the market value of the preferred stock?

      a. $125
      b. $120
      c. $175
      d. $150
      e. $200

Preferred stock yield   **Answer: c Diff: E**

42.   A share of preferred stock pays a quarterly dividend of $2.50. If the
      price of this preferred stock is currently $50, what is the nominal annual
      rate of return?

      a. 12%
      b. 18%
      c. 20%
      d. 23%
      e. 28%

Preferred stock yield   **Answer: a Diff: E**

43.   A share of preferred stock pays a dividend of $0.50 each quarter. If you
      are willing to pay $20.00 for this preferred stock, what is your nominal
      (not effective) annual rate of return?

      a. 10%
      b. 8%
      c. 6%
      d. 12%
      e. 14%

Stock price   **Answer: d Diff: E**

44.   Assume that you plan to buy a share of XYZ stock today and to hold it for 2
      years. Your expectations are that you will not receive a dividend at the
      end of Year 1, but you will receive a dividend of $9.25 at the end of
      Year 2. In addition, you expect to sell the stock for $150 at the end of
      Year 2. If your expected rate of return is 16 percent, how much should you
      be willing to pay for this stock today?

      a. $164.19
      b. $ 75.29
      c. $107.53
      d. $118.35
      e. $131.74

Future stock price--constant growth   **Answer: d Diff: E**

45.   Womack Toy Company's stock is currently trading at $25 per share. The
      stock's dividend is projected to increase at a constant rate of
      7 percent per year. The required rate of return on the stock, k_s, is 10
      percent. What is the expected price of the stock 4 years from today?

      a. $36.60
      b. $34.15
      c. $28.39
      d. $32.77
      e. $30.63

Future stock price--constant growth   **Answer: b Diff: E**

46. Allegheny Publishing's stock is expected to pay a year-end dividend, D_1, of
     $4.00. The dividend is expected to grow at a constant rate of
     8 percent per year, and the stock's required rate of return is 12 percent.
     Given this information, what is the expected price of the stock, eight
     years from now?

     a. $200.00
     b. $185.09
     c. $171.38
     d. $247.60
     e. $136.86

Future stock price--constant growth   **Answer: a Diff: E**

47. Waters Corporation has a stock price of $20 a share. The stock's year-end
     dividend is expected to be $2 a share ($D_1 = \$2.00$). The stock's required
     rate of return is 15 percent and the stock's dividend is expected to grow
     at the same constant rate forever. What is the expected price of the stock
     seven years from now?

     a. $28
     b. $53
     c. $27
     d. $23
     e. $39

Future stock price--constant growth   **Answer: a Diff: E**

48. Trudeau Technologies' common stock currently trades at $40 per share. The
     stock is expected to pay a year-end dividend, D_1, of $2 per share. The
     stock's dividend is expected to grow at a constant rate g, and its required
     rate of return is 9 percent. What is the expected price of the stock five
     years from today (after the dividend D_5 has been paid)? In
     other words, what is $\hat{P}_5$?

     a. $48.67
     b. $50.61
     c. $51.05
     d. $61.40
     e. $61.54

Future stock price--constant growth   **Answer: e Diff: E N**

49. A stock is expected to pay a dividend of $0.50 at the end of the year
     (i.e., $D_1 = 0.50$). Its dividend is expected to grow at a constant rate of
     7 percent a year, and the stock has a required return of 12 percent. What
     is the expected price of the stock four years from today?

     a. $ 5.46
     b. $ 9.36
     c. $10.00
     d. $12.18
     e. $13.11

Constant growth stock **Answer: b Diff: E**

50.   McKenna Motors is expected to pay a $1.00 per-share dividend at the end of the year ($D_1 = \$1.00$). The stock sells for $20 per share and its required rate of return is 11 percent. The dividend is expected to grow at a constant rate, g, forever. What is the growth rate, g, for this stock?

   a. 5%
   b. 6%
   c. 7%
   d. 8%
   e. 9%

Constant growth stock **Answer: a Diff: E**

51.   A share of common stock has just paid a dividend of $2.00. If the expected long-run growth rate for this stock is 15 percent, and if investors require a 19 percent rate of return, what is the price of the stock?

   a. $57.50
   b. $62.25
   c. $71.86
   d. $64.00
   e. $44.92

Constant growth stock **Answer: e Diff: E**

52.   Thames Inc.'s most recent dividend was $2.40 per share ($D_0 = \$2.40$). The dividend is expected to grow at a rate of 6 percent per year. The risk-free rate is 5 percent and the return on the market is 9 percent. If the company's beta is 1.3, what is the price of the stock today?

   a. $72.14
   b. $57.14
   c. $40.00
   d. $68.06
   e. $60.57

Constant growth stock **Answer: c Diff: E**

53.   Albright Motors is expected to pay a year-end dividend of $3.00 a share ($D_1 = \$3.00$). The stock currently sells for $30 a share. The required (and expected) rate of return on the stock is 16 percent. If the dividend is expected to grow at a constant rate, g, what is g?

   a. 13.00%
   b. 10.05%
   c. 6.00%
   d. 5.33%
   e. 7.00%

Constant growth stock   **Answer: d Diff: E**

54. A stock with a required rate of return of 10 percent sells for $30 per share. The stock's dividend is expected to grow at a constant rate of 7 percent per year. What is the expected year-end dividend, D_1, on the stock?

 a. $0.87
 b. $0.95
 c. $1.02
 d. $0.90
 e. $1.05

Constant growth stock   **Answer: b Diff: E**

55. Gettysburg Grocers' stock is expected to pay a year-end dividend, D_1, of $2.00 per share. The dividend is expected to grow at a constant rate of 5 percent, and the stock has a required return of 9 percent. What is the expected price of the stock five years from today?

 a. $67.00
 b. $63.81
 c. $51.05
 d. $ 0.64
 e. $60.83

Constant growth stock   **Answer: d Diff: E**

56. A stock is expected to have a dividend per share of $0.60 at the end of the year ($D_1 = 0.60$). The dividend is expected to grow at a constant rate of 7 percent per year, and the stock has a required return of 12 percent. What is the expected price of the stock five years from today? (That is, what is $\hat{P}_5$?)

 a. $12.02
 b. $15.11
 c. $15.73
 d. $16.83
 e. $21.15

Constant growth stock   **Answer: b Diff: E N**

57. A stock is expected to pay a $0.45 dividend at the end of the year ($D_1 = 0.45$). The dividend is expected to grow at a constant rate of 4 percent a year, and the stock's required rate of return is 11 percent. What is the expected price of the stock 10 years from today?

 a. $18.25
 b. $ 9.52
 c. $ 9.15
 d. $ 6.02
 e. $12.65

Nonconstant growth stock   **Answer: d Diff: E**

58.   The last dividend paid by Klein Company was $1.00. Klein's growth rate is
      expected to be a constant 5 percent for 2 years, after which dividends are
      expected to grow at a rate of 10 percent forever. Klein's required rate of
      return on equity (k_s) is 12 percent. What is the current price of Klein's
      common stock?

      a. $21.00
      b. $33.33
      c. $42.25
      d. $50.16
      e. $58.75

Nonconstant growth stock   **Answer: d Diff: E**

59.   Your company paid a dividend of $2.00 last year. The growth rate is
      expected to be 4 percent for 1 year, 5 percent the next year, then
      6 percent for the following year, and then the growth rate is expected to
      be a constant 7 percent thereafter. The required rate of return on equity
      (k_s) is 10 percent. What is the current stock price?

      a. $53.45
      b. $60.98
      c. $64.49
      d. $67.47
      e. $69.21

Beta coefficient   **Answer: b Diff: E**

60.   Cartwright Brothers' stock is currently selling for $40 a share. The stock
      is expected to pay a $2 dividend at the end of the year. The stock's
      dividend is expected to grow at a constant rate of 7 percent a year
      forever. The risk-free rate (k_{RF}) is 6 percent and the market risk premium
      ($k_M - k_{RF}$) is also 6 percent. What is the stock's beta?

      a. 1.06
      b. 1.00
      c. 2.00
      d. 0.83
      e. 1.08

New issues and dilution   **Answer: b Diff: E**

61.   NOPREM Inc. is a firm whose shareholders don't possess the preemptive
      right. The firm currently has 1,000 shares of stock outstanding; the price
      is $100 per share. The firm plans to issue an additional 1,000 shares at
      $90.00 per share. Since the shares will be offered to the public at large,
      what is the amount per share that old shareholders will lose if they are
      excluded from purchasing new shares?

      a. $90.00
      b. $ 5.00
      c. $10.00
      d. $ 0
      e. $ 2.50

FCF model for valuing stock   **Answer: d Diff: E N**

62. An analyst is trying to estimate the intrinsic value of the stock of
     Harkleroad Technologies. The analyst estimates that Harkleroad's free cash
     flow during the next year will be $25 million. The analyst also estimates
     that the company's free cash flow will increase at a constant rate of 7
     percent a year and that the company's WACC is 10 percent. Harkleroad has
     $200 million of long-term debt and preferred stock, and 30 million
     outstanding shares of common stock. What is the estimated per-share price
     of Harkleroad Technologies' common stock?

     a. $ 1.67
     b. $ 5.24
     c. $18.37
     d. $21.11
     e. $27.78

FCF model for valuing stock   **Answer: d Diff: E N**

63. An analyst estimating the intrinsic value of the Rein Corporation stock
     estimates that its free cash flow at the end of the year (t = 1) will be
     $300 million. The analyst estimates that the firm's free cash flow will
     grow at a constant rate of 7 percent a year, and that the company's
     weighted average cost of capital is 11 percent. The company currently has
     debt and preferred stock totaling $500 million. There are 150 million
     outstanding shares of common stock. What is the intrinsic value (per
     share) of the company's stock?

     a. $16.67
     b. $25.00
     c. $33.33
     d. $46.67
     e. $50.00

Medium:

Changing beta and the equilibrium stock price   **Answer: d Diff: M**

64. Ceejay Corporation's stock is currently selling at an equilibrium price of
     $30 per share. The firm has been experiencing a 6 percent annual growth
     rate. Last year's earnings per share, E_0, were $4.00 and the dividend
     payout ratio is 40 percent. The risk-free rate is 8 percent, and the
     market risk premium is 5 percent. If market risk (beta) increases by 50
     percent, and all other factors remain constant, what will be the new stock
     price? (Use 4 decimal places in your calculations.)

     a. $16.59
     b. $18.25
     c. $21.39
     d. $22.69
     e. $53.48

Equilibrium stock price   **Answer: b   Diff: M**

65.   You are given the following data:

    • The risk-free rate is 5 percent.
    • The required return on the market is 8 percent.
    • The expected growth rate for the firm is 4 percent.
    • The last dividend paid was $0.80 per share.
    • Beta is 1.3.

    Now assume the following changes occur:

    • The inflation premium drops by 1 percent.
    • An increased degree of risk aversion causes the required return on the market to rise to 10 percent after adjusting for the changed inflation premium.
    • The expected growth rate increases to 6 percent.
    • Beta rises to 1.5.

    What will be the change in price per share, assuming the stock was in equilibrium before the changes occurred?

    a. +$12.11
    b. -$ 4.87
    c. +$ 6.28
    d. -$16.97
    e. +$ 2.78

Constant growth stock   **Answer: d   Diff: M**

66.   A stock that currently trades for $40 per share is expected to pay a year-end dividend of $2 per share. The dividend is expected to grow at a constant rate over time. The stock has a beta of 1.2, the risk-free rate is 5 percent, and the market risk premium is 5 percent. What is the stock's expected price seven years from today?

    a. $ 56.26
    b. $ 58.01
    c. $ 83.05
    d. $ 60.15
    e. $551.00

Constant growth stock   **Answer: c   Diff: M N**

67.   Yohe Technology's stock is expected to pay a dividend of $2.00 a share at the end of the year. The stock currently has a price of $40 a share, and the stock's dividend is expected to grow at a constant rate of g percent a year. The stock has a beta of 1.2. The market risk premium, $k_M - k_{RF}$, is 7 percent and the risk-free rate is 5 percent. What is the expected price of Yohe's stock 5 years from today?

    a. $51.05
    b. $55.23
    c. $59.87
    d. $64.90
    e. $66.15

Nonconstant growth stock   **Answer: a Diff: M**

68. Motor Homes Inc. (MHI) is presently in a stage of abnormally high growth because of a surge in the demand for motor homes. The company expects earnings and dividends to grow at a rate of 20 percent for the next 4 years, after which time there will be no growth (g = 0) in earnings and dividends. The company's last dividend was $1.50. MHI's beta is 1.6, the return on the market is currently 12.75 percent, and the risk-free rate is 4 percent. What should be the current common stock price?

    a. $15.17
    b. $17.28
    c. $22.21
    d. $19.10
    e. $24.66

Nonconstant growth stock   **Answer: d Diff: M**

69. A stock is not expected to pay a dividend over the next four years. Five years from now, the company anticipates that it will establish a dividend of $1.00 per share (i.e., $D_5 = \$1.00$). Once the dividend is established, the market expects that the dividend will grow at a constant rate of 5 percent per year forever. The risk-free rate is 5 percent, the company's beta is 1.2, and the market risk premium is 5 percent. The required rate of return on the company's stock is expected to remain constant. What is the current stock price?

    a. $ 7.36
    b. $ 8.62
    c. $ 9.89
    d. $10.98
    e. $11.53

Nonconstant growth stock   **Answer: d Diff: M**

70. Mack Industries just paid a dividend of $1.00 per share ($D_0 = \$1.00$). Analysts expect the company's dividend to grow 20 percent this year ($D_1 = \$1.20$) and 15 percent next year. After two years the dividend is expected to grow at a constant rate of 5 percent. The required rate of return on the company's stock is 12 percent. What should be the company's current stock price?

    a. $12.33
    b. $16.65
    c. $16.91
    d. $18.67
    e. $19.67

Nonconstant growth stock   **Answer: a   Diff: M**

71. R. E. Lee recently took his company public through an initial public offering. He is expanding the business quickly to take advantage of an otherwise unexploited market. Growth for his company is expected to be 40 percent for the first three years and then he expects it to slow down to a constant 15 percent. The most recent dividend (D_0) was $0.75. Based on the most recent returns, his company's beta is approximately 1.5. The risk-free rate is 8 percent and the market risk premium is 6 percent. What is the current price of Lee's stock?

    a. $77.14
    b. $75.17
    c. $67.51
    d. $73.88
    e. $93.20

Nonconstant growth stock   **Answer: a   Diff: M**

72. A stock is expected to pay no dividends for the first three years, that is, $D_1 = \$0$, $D_2 = \$0$, and $D_3 = \$0$. The dividend for Year 4 is expected to be $5.00 ($D_4 = \$5.00$), and it is anticipated that the dividend will grow at a constant rate of 8 percent a year thereafter. The risk-free rate is 4 percent, the market risk premium is 6 percent, and the stock's beta is 1.5. Assuming the stock is fairly priced, what is its current stock price?

    a. $ 69.31
    b. $ 72.96
    c. $ 79.38
    d. $ 86.38
    e. $100.00

Nonconstant growth stock   **Answer: e   Diff: M**

73. Stewart Industries expects to pay a $3.00 per share dividend on its common stock at the end of the year ($D_1 = \$3.00$). The dividend is expected to grow 25 percent a year until t = 3, after which time the dividend is expected to grow at a constant rate of 5 percent a year ($D_3 = \$4.6875$ and $D_4 = \$4.921875$). The stock's beta is 1.2, the risk-free rate of interest is 6 percent, and the market rate of return is 11 percent. What is the company's current stock price?

    a. $29.89
    b. $30.64
    c. $37.29
    d. $53.69
    e. $59.05

Nonconstant growth stock   **Answer: b Diff: M**

74. McPherson Enterprises is planning to pay a dividend of $2.25 per share at the end of the year ($D_1 = \$2.25$). The company is planning to pay the same dividend each of the following 2 years and will then increase the dividend to $3.00 for the subsequent 2 years (D_4 and D_5). After that time the dividends will grow at a constant rate of 5 percent per year. If the required return on the company's common stock is 11 percent per year, what is its current stock price?

    a. $52.50
    b. $40.41
    c. $37.50
    d. $50.00
    e. $32.94

Nonconstant growth stock   **Answer: b Diff: M**

75. Hadlock Healthcare expects to pay a $3.00 dividend at the end of the year ($D_1 = \$3.00$). The stock's dividend is expected to grow at a rate of 10 percent a year until three years from now ($t = 3$). After this time, the stock's dividend is expected to grow at a constant rate of 5 percent a year. The stock's required rate of return is 11 percent. What is the price of the stock today?

    a. $49
    b. $54
    c. $64
    d. $52
    e. $89

Nonconstant growth stock   **Answer: e Diff: M**

76. Rogers Robotics currently (2003) does not pay a dividend. However, the company is expected to pay a $1.00 dividend two years from today (2005). The dividend is then expected to grow at a rate of 20 percent a year for the following three years. After the dividend is paid in 2008, it is expected to grow forever at a constant rate of 7 percent. Currently, the risk-free rate is 6 percent, market risk premium ($k_M - k_{RF}$) is 5 percent, and the stock's beta is 1.4. What should be the price of the stock today?

    a. $22.91
    b. $21.20
    c. $30.82
    d. $28.80
    e. $20.16

77.   Whitesell Technology has just paid a dividend (D_0) and is expected to pay a
      $2.00 per-share dividend at the end of the year (D_1).   The dividend is
      expected to grow 25 percent a year for the following four years, (D_5 =
      $2.00 × $(1.25)^4$ = $4.8828). After this time period, the dividend will grow
      forever at a constant rate of 7 percent a year. The stock has a required
      rate of return of 13 percent (k_s = 0.13). What is the expected price of
      the stock two years from today? (Calculate the price assuming that D_2 has
      already been paid.)

      a. $83.97
      b. $95.87
      c. $69.56
      d. $67.63
      e. $91.96

78.   A stock, which currently does not pay a dividend, is expected to pay its
      first dividend of $1.00 per share in five years (D_5 = $1.00).   After the
      dividend is established, it is expected to grow at an annual rate of 25
      percent per year for the following three years (D_8 = $1.953125) and then
      grow at a constant rate of 5 percent per year thereafter. Assume that the
      risk-free rate is 5.5 percent, the market risk premium is 4 percent, and
      that the stock's beta is 1.2. What is the expected price of the stock
      today?

      a. $23.87
      b. $30.56
      c. $18.72
      d. $20.95
      e. $20.65

79.   An analyst estimates that Cheyenne Co. will pay the following dividends: D_1
      = $3.0000, D_2 = $3.7500, and D_3 = $4.3125.   The analyst also estimates that
      the required rate of return on Cheyenne's stock is 12.2 percent. After the
      third dividend, the dividend is expected to grow by 8 percent per year
      forever. What is the price of the stock today?

      a. $81.40
      b. $84.16
      c. $85.27
      d. $87.22
      e. $94.02

Nonconstant growth stock   **Answer: a   Diff: M**

80.   Lewisburg Company's stock is expected to pay a dividend of $1.00 per share
      at the end of the year. The dividend is expected to grow 20 percent per
      year each of the following three years (D_4 = $1.7280), after which time the
      dividend is expected to grow at a constant rate of 7 percent per year. The
      stock's beta is 1.2, the market risk premium is 4 percent, and the risk-
      free rate is 5 percent. What is the price of the stock today?

      a. $49.61
      b. $45.56
      c. $48.43
      d. $46.64
      e. $45.45

Nonconstant growth stock   **Answer: d   Diff: M**

81.   Namath Corporation's stock is expected to pay a dividend of $1.25 per share
      at the end of the year. The dividend is expected to increase by 20 percent
      per year for each of the following two years. After that, the dividend is
      expected to increase at a constant rate of 8 percent per year. The stock
      has a required return of 10 percent. What should be the price of the stock
      today?

      a. $50.00
      b. $59.38
      c. $70.11
      d. $76.76
      e. $84.43

Nonconstant growth stock   **Answer: b   Diff: M   N**

82.   A stock is expected to pay a dividend of $1.00 at the end of the year
      (i.e., D_1 = $1.00). The dividend is expected to grow 25 percent each of
      the following two years, after which time it is expected to grow at a
      constant rate of 6 percent a year. The stock's required return is 11
      percent. Assume that the market is in equilibrium. What is the stock's
      price today?

      a. $26.14
      b. $27.28
      c. $30.48
      d. $32.71
      e. $35.38

Nonconstant growth stock **Answer: c Diff: M**

83. Garcia Inc. has a current dividend of $3.00 per share ($D_0 = \$3.00$). Analysts expect that the dividend will grow at a rate of 25 percent a year for the next three years, and thereafter it will grow at a constant rate of 10 percent a year. The company's cost of equity capital is estimated to be 15 percent. What is Garcia's current stock price?

    a. $ 75.00
    b. $ 88.55
    c. $ 95.42
    d. $103.25
    e. $110.00

Nonconstant growth stock **Answer: a Diff: M**

84. Holmgren Hotels' stock has a required return of 11 percent. The stock currently does not pay a dividend but it expects to begin paying a dividend of $1.00 per share starting five years from today ($D_5 = \$1.00$). Once established the dividend is expected to grow by 25 percent per year for two years, after which time it is expected to grow at a constant rate of 10 percent per year. What should be Holmgren's stock price today?

    a. $ 84.80
    b. $174.34
    c. $ 76.60
    d. $ 94.13
    e. $ 77.27

Nonconstant growth stock **Answer: a Diff: M N**

85. A stock just paid a $1.00 dividend ($D_0 = 1.00$). The dividend is expected to grow 25 percent a year for the next four years, after which time the dividend is expected to grow at a constant rate of 5 percent a year. The stock's required return is 12 percent. What is the price of the stock today?

    a. $28.58
    b. $26.06
    c. $32.01
    d. $ 9.62
    e. $27.47

Supernormal growth stock **Answer: e Diff: M**

86. A share of stock has a dividend of $D_0 = \$5$. The dividend is expected to grow at a 20 percent annual rate for the next 10 years, then at a 15 percent rate for 10 more years, and then at a long-run normal growth rate of 10 percent forever. If investors require a 10 percent return on this stock, what is its current price?

    a. $100.00
    b. $ 82.35
    c. $195.50
    d. $212.62
    e. The data given in the problem are internally inconsistent, that is, the situation described is impossible in that no equilibrium price can be produced.

Supernormal growth stock   **Answer: b Diff: M**

87. ABC Company has been growing at a 10 percent rate, and it just paid a dividend of $D_0 = \$3.00$. Due to a new product, ABC expects to achieve a dramatic increase in its short-run growth rate, to 20 percent annually for the next 2 years. After this time, growth is expected to return to the long-run constant rate of 10 percent. The company's beta is 2.0, the required return on an average stock is 11 percent, and the risk-free rate is 7 percent. What should be the dividend yield (D_1/P_0) today?

    a. 3.93%
    b. 4.60%
    c. 10.00%
    d. 7.54%
    e. 2.33%

Supernormal growth stock   **Answer: b Diff: M**

88. DAA's stock is selling for $15 per share. The firm's income, assets, and stock price have been growing at an annual 15 percent rate and are expected to continue to grow at this rate for 3 more years. No dividends have been declared as yet, but the firm intends to declare a dividend of $D_3 = \$2.00$ at the end of the last year of its supernormal growth. After that, dividends are expected to grow at the firm's normal growth rate of 6 percent. The firm's required rate of return is 18 percent. The stock is

    a. Undervalued by $3.03.
    b. Overvalued by $3.03.
    c. Correctly valued.
    d. Overvalued by $2.25.
    e. Undervalued by $2.25.

Supernormal growth stock   **Answer: b Diff: M**

89. Faulkner Corporation expects to pay an end-of-year dividend, D_1, of $1.50 per share. For the next two years the dividend is expected to grow by 25 percent per year, after which time the dividend is expected to grow at a constant rate of 7 percent per year. The stock has a required rate of return of 12 percent. Assuming that the stock is fairly valued, what is the price of the stock today?

    a. $45.03
    b. $40.20
    c. $37.97
    d. $36.38
    e. $45.03

Supernormal growth stock   **Answer: b   Diff: M**

90. Assume that the average firm in your company's industry is expected to grow at a constant rate of 5 percent, and its dividend yield is 4 percent. Your company is about as risky as the average firm in the industry, but it has just developed a line of innovative new products, which leads you to expect that its earnings and dividends will grow at a rate of 40 percent ($D_1 = D_0(1.40)$) this year and 25 percent the following year after which growth should match the 5 percent industry average rate. The last dividend paid (D_0) was $2. What is the stock's value per share?

    a. $ 42.60
    b. $ 82.84
    c. $ 91.88
    d. $101.15
    e. $110.37

Declining growth stock   **Answer: d   Diff: M**

91. The Textbook Production Company has been hit hard due to increased competition. The company's analysts predict that earnings (and dividends) will decline at a rate of 5 percent annually forever. Assume that $k_s = 11$ percent and $D_0 = \$2.00$. What will be the price of the company's stock three years from now?

    a. $27.17
    b. $ 6.23
    c. $28.50
    d. $10.18
    e. $20.63

Stock growth rate   **Answer: d   Diff: M**

92. Berg Inc. has just paid a dividend of $2.00. Its stock is now selling for $48 per share. The firm is half as risky as the market. The expected return on the market is 14 percent, and the yield on U.S. Treasury bonds is 11 percent. If the market is in equilibrium, what growth rate is expected?

    a. 13%
    b. 10%
    c. 4%
    d. 8%
    e. -2%

Stock growth rate   **Answer: e   Diff: M**

93. Grant Corporation's stock is selling for $40 in the market. The company's beta is 0.8, the market risk premium is 6 percent, and the risk-free rate is 9 percent. The previous dividend was $2 ($D_0 = \$2$) and dividends are expected to grow at a constant rate. What is the stock's growth rate?

    a. 5.52%
    b. 5.00%
    c. 13.80%
    d. 8.80%
    e. 8.38%

Capital gains yield   **Answer: c Diff: M**

94.   Carlson Products, a constant growth company, has a current market (and
      equilibrium) stock price of $20.00. Carlson's next dividend, D_1, is
      forecasted to be $2.00, and Carlson is growing at an annual rate of
      6 percent. Carlson has a beta coefficient of 1.2, and the required rate of
      return on the market is 15 percent. As Carlson's financial manager, you
      have access to insider information concerning a switch in product lines
      that would not change the growth rate, but would cut Carlson's beta
      coefficient in half. If you buy the stock at the current market price,
      what is your expected percentage capital gain?

      a. 23%
      b. 33%
      c. 43%
      d. 53%
      e. There would be a capital loss.

Capital gains yield   **Answer: d Diff: M**

95.   Given the following information, calculate the expected capital gains yield
      for Chicago Bears Inc.: beta = 0.6; k_M = 15%; k_{RF} = 8%; D_1 = $2.00; P_0 =
      $25.00. Assume the stock is in equilibrium and exhibits constant growth.

      a. 3.8%
      b.   0%
      c. 8.0%
      d. 4.2%
      e. 2.5%

Capital gains yield and dividend yield   **Answer: e Diff: M**

96.   Conner Corporation has a stock price of $32.35 per share. The last
      dividend was $3.42 ($D_0$ = $3.42). The long-run growth rate for the company
      is a constant 7 percent. What is the company's capital gains yield and
      dividend yield?

      a. Capital gains yield = 7.00%; Dividend yield = 10.57%
      b. Capital gains yield = 10.57%; Dividend yield = 7.00%
      c. Capital gains yield = 7.00%; Dividend yield = 4.31%
      d. Capital gains yield = 11.31%; Dividend yield = 7.00%
      e. Capital gains yield = 7.00%; Dividend yield = 11.31%

Expected return and P/E ratio   **Answer: b   Diff: M**

97.   Lamonica Motors just reported earnings per share of $2.00. The stock has a price earnings ratio of 40, so the stock's current price is $80 per share. Analysts expect that one year from now the company will have an EPS of $2.40, and it will pay its first dividend of $1.00 per share. The stock has a required return of 10 percent. What price earnings ratio must the stock have one year from now so that investors realize their expected return?

     a. 44.00
     b. 36.25
     c. 4.17
     d. 40.00
     e. 36.67

Stock price and P/E ratio   **Answer: a   Diff: M**

98.   During the past few years, Swanson Company has retained, on the average, 70 percent of its earnings in the business. The future retention rate is expected to remain at 70 percent of earnings, and long-run earnings growth is expected to be 10 percent. If the risk-free rate, k_{RF}, is 8 percent, the expected return on the market, k_M, is 12 percent, Swanson's beta is 2.0, and the most recent dividend, D_0, was $1.50, what is the most likely market price and P/E ratio (P_0/E_1) for Swanson's stock today?

     a. $27.50; 5.0×
     b. $33.00; 6.0×
     c. $25.00; 5.0×
     d. $22.50; 4.5×
     e. $45.00; 4.5×

Stock price   **Answer: d   Diff: M**

99.   You have been given the following projections for Cali Corporation for the coming year.

- Sales = 10,000 units.
- Sales price per unit = $10.
- Variable cost per unit = $5.
- Fixed costs = $10,000.
- Bonds outstanding = $15,000.
- k_d on outstanding bonds = 8%.
- Tax rate = 40%.
- Shares of common stock outstanding = 10,000 shares.
- Beta = 1.4.
- k_{RF} = 5%.
- k_M = 9%.
- Dividend payout ratio = 60%.
- Growth rate = 8%.

Calculate the current price per share for Cali Corporation.

     a. $35.22
     b. $46.27
     c. $48.55
     d. $53.72
     e. $59.76

Beta coefficient   **Answer: c Diff: M**

100. As financial manager of Material Supplies Inc., you have recently
     participated in an executive committee decision to enter into the plastics
     business. Much to your surprise, the price of the firm's common stock
     subsequently declined from $40 per share to $30 per share. While there have
     been several changes in financial markets during this period, you are
     anxious to determine how the market perceives the relevant risk of your
     firm. Assume that the market is in equilibrium. From the following data
     you find that the beta value associated with your firm has changed from an
     old beta of _____ to a new beta of _____.

     • The real risk-free rate is 2 percent, but the inflation premium has
       increased from 4 percent to 6 percent.
     • The expected growth rate has been re-evaluated by security analysts, and
       a 10.5 percent rate is considered to be more realistic than the previous
       5 percent rate. This change had nothing to do with the move into
       plastics; it would have occurred anyway.
     • The risk aversion attitude of the market has shifted somewhat, and now
       the market risk premium is 3 percent instead of 2 percent.
     • The next dividend, D_1, was expected to be $2 per share, assuming the
       "old" 5 percent growth rate.

     a. 2.00; 1.50
     b. 1.50; 3.00
     c. 2.00; 3.17
     d. 1.67; 2.00
     e. 1.50; 1.67

Risk and stock value   **Answer: d Diff: M**

101. The probability distribution for k_M for the coming year is as follows:

Probability	k_M
0.05	7%
0.30	8
0.30	9
0.30	10
0.05	12

     If k_{RF} = 6.05% and Stock X has a beta of 2.0, an expected constant growth
     rate of 7 percent, and D_0 = $2, what market price gives the investor a
     return consistent with the stock's risk?

     a. $25.00
     b. $37.50
     c. $21.72
     d. $42.38
     e. $56.94

Future stock price--constant growth   **Answer: b Diff: M**

102. Newburn Entertainment's stock is expected to pay a year-end dividend of
      $3.00 a share ($D_1$ = $3.00). The stock's dividend is expected to grow at a
      constant rate of 5 percent a year.   The risk-free rate, k_{RF}, is
      6 percent and the market risk premium, (k_M − k_{RF}), is 5 percent. The stock
      has a beta of 0.8. What is the stock's expected price five years from now?

      a. $60.00
      b. $76.58
      c. $96.63
      d. $72.11
      e. $68.96

Future stock price--constant growth   **Answer: e Diff: M**

103. A stock currently sells for $28 a share. Its dividend is growing at a
      constant rate, and its dividend yield is 5 percent. The required rate of
      return on the company's stock is expected to remain constant at 13 percent.
      What is the expected stock price seven years from now?

      a. $24.62
      b. $29.99
      c. $39.40
      d. $41.83
      e. $47.99

Future stock price--constant growth   **Answer: b Diff: M**

104. Graham Enterprises anticipates that its dividend at the end of the year
      will be $2.00 a share ($D_1$ = $2.00). The dividend is expected to grow at a
      constant rate of 7 percent a year. The risk-free rate is 6 percent, the
      market risk premium is 5 percent, and the company's beta equals 1.2. What
      is the expected stock price five years from now?

      a. $52.43
      b. $56.10
      c. $63.49
      d. $70.49
      e. $72.54

Future stock price--constant growth   **Answer: b Diff: M**

105. Kirkland Motors expects to pay a $2.00 per share dividend on its common
      stock at the end of the year (D_1 = $2.00). The stock currently sells for
      $20.00 a share. The required rate of return on the company's stock is 12
      percent (k_s = 0.12).   The dividend is expected to grow at some constant
      rate over time. What is the expected stock price five years from now, that
      is, what is $\hat{P}_5$?

      a. $21.65
      b. $22.08
      c. $25.64
      d. $35.25
      e. $36.78

Future stock price--constant growth   **Answer: b Diff: M**

106. McNally Motors has yet to pay a dividend on its common stock. However, the company expects to pay a $1.00 dividend starting two years from now ($D_2 = 1.00). Thereafter, the stock's dividend is expected to grow at a constant rate of 5 percent a year. The stock's beta is 1.4, the risk-free rate is $k_{RF} = 0.06$, and the expected market return is $k_M = 0.12$. What is the stock's expected price four years from now, that is, what is $\hat{P}_4$?

   a. $10.63
   b. $12.32
   c. $11.87
   d. $13.58
   e. $11.21

Future stock price--constant growth   **Answer: b Diff: M**

107. Dawson Energy is expected to pay an end-of-year dividend, D_1, of $2.00 per share, and it is expected to grow at a constant rate over time. The stock has a required rate of return of 14 percent and a dividend yield, D_1/P_0, of 5 percent. What is the expected price of the stock five years from today?

   a. $77.02
   b. $61.54
   c. $56.46
   d. $40.00
   e. $51.05

Future stock price--constant growth   **Answer: e Diff: M N**

108. A stock is expected to pay a $2.50 dividend at the end of the year ($D_1 = 2.50). The dividend is expected to grow at a constant rate of 6 percent a year. The stock's beta is 1.2, the risk-free rate is 4 percent, and the market risk premium is 5 percent. What is the expected stock price eight years from today?

   a. $105.59
   b. $104.86
   c. $133.97
   d. $ 65.79
   e. $ 99.62

FCF model for valuing stock   **Answer: a Diff: M**

109. Today is December 31, 2003. The following information applies to Addison Airlines:

- After-tax, operating income [EBIT(1 - T)] for the year 2004 is expected to be $400 million.
- The company's depreciation expense for the year 2004 is expected to be $80 million.
- The company's capital expenditures for the year 2004 are expected to be $160 million.
- No change is expected in the company's net operating working capital.
- The company's free cash flow is expected to grow at a constant rate of 5 percent per year.
- The company's cost of equity is 14 percent.
- The company's WACC is 10 percent.
- The current market value of the company's debt is $1.4 billion.
- The company currently has 125 million shares of stock outstanding.

Using the free cash flow valuation method, what should be the company's stock price today?

a. $ 40
b. $ 50
c. $ 25
d. $ 85
e. $100

FCF model for valuing stock   **Answer: b Diff: M N**

110. A stock market analyst is evaluating the common stock of Keane Investment. She estimates that the company's operating income (EBIT) for the next year will be $800 million. Furthermore, she predicts that Keane Investment will require $255 million in gross capital expenditures (gross expenditures represent capital expenditures before deducting depreciation) next year. In addition, next year's depreciation expense will be $75 million, and no changes in net operating working capital are expected. Free cash flow is expected to grow at a constant annual rate of 6 percent a year. The company's WACC is 9 percent, its cost of equity is 14 percent, and its before-tax cost of debt is 7 percent. The company has $900 million of debt, $500 million of preferred stock, and has 200 million outstanding shares of common stock. The firm's tax rate is 40 percent. Using the free cash flow valuation method, what is the predicted price of the stock today?

a. $ 11.75
b. $ 43.00
c. $ 55.50
d. $ 96.33
e. $108.83

FCF model for valuing stock **Answer: b Diff: M N**

111. An analyst is trying to estimate the intrinsic value of Burress Inc. The analyst has estimated the company's free cash flows for the following years:

Year	Free Cash Flow
1	$3,000
2	4,000
3	5,000

The analyst estimates that after three years (t = 3) the company's free cash flow will grow at a constant rate of 6 percent per year. The analyst estimates that the company's weighted average cost of capital is 10 percent. The company's debt and preferred stock has a total market value of $25,000 and there are 1,000 outstanding shares of common stock. What is the (per-share) intrinsic value of the company's common stock?

a. $ 78.31
b. $ 84.34
c. $ 98.55
d. $109.34
e. $112.50

FCF model for valuing stock **Answer: e Diff: M N**

112. An analyst has collected the following information about Franklin Electric:

- Projected EBIT for the next year $300 million.
- Projected depreciation expense for the next year $50 million.
- Projected capital expenditures for the next year $100 million.
- Projected increase in operating working capital next year $60 million.
- Tax rate 40%.
- WACC 10%.
- Cost of equity 13%.
- Market value of debt and preferred stock today $500 million.
- Number of shares outstanding today 20 million.

The company's free cash flow is expected to grow at a constant rate of 6 percent a year. The analyst uses the corporate value model approach to estimate the stock's intrinsic value. What is the stock's intrinsic value today?

a. $ 87.50
b. $212.50
c. $110.71
d. $ 25.00
e. $ 62.50

New equity and equilibrium price   **Answer: c   Diff: M**

113. Nahanni Treasures Corporation is planning a new common stock issue of five
      million shares to fund a new project. The increase in shares will bring to
      25 million the number of shares outstanding. Nahanni's long-term growth
      rate is 6 percent, and its current required rate of return is 12.6 percent.
      The firm just paid a $1.00 dividend and the stock sells for $16.06 in the
      market. When the new equity issue was announced, the firm's stock price
      dropped. Nahanni estimates that the company's growth rate will increase to
      6.5 percent with the new project, but since the project is riskier than
      average, the firm's cost of capital will increase to 13.5 percent. Using
      the DCF growth model, what is the change in the equilibrium stock price?

      a. -$1.77
      b. -$1.06
      c. -$0.85
      d. -$0.66
      e. -$0.08

Tough:

Risk and stock price   **Answer: a   Diff: T**

114. Hard Hat Construction's stock is currently selling at an equilibrium price
      of $30 per share. The firm has been experiencing a 6 percent annual growth
      rate. Last year's earnings per share, E_0, were $4.00, and the dividend
      payout ratio is 40 percent. The risk-free rate is 8 percent, and the
      market risk premium is 5 percent. If market risk (beta) increases by 50
      percent, and all other factors remain constant, by how much will the stock
      price change? (Hint: Use four decimal places in your calculations.)

      a. -$ 7.33
      b. +$ 7.14
      c. -$15.00
      d. -$15.22
      e. +$22.63

Constant growth stock   **Answer: c   Diff: T**

115. Philadelphia Corporation's stock recently paid a dividend of $2.00 per
      share ($D_0 = $2), and the stock is in equilibrium. The company has a
      constant growth rate of 5 percent and a beta equal to 1.5. The required
      rate of return on the market is 15 percent, and the risk-free rate is 7
      percent. Philadelphia is considering a change in policy that will increase
      its beta coefficient to 1.75. If market conditions remain unchanged, what
      new constant growth rate will cause Philadelphia's common stock price to
      remain unchanged?

      a. 8.85%
      b. 18.53%
      c. 6.77%
      d. 5.88%
      e. 13.52%

Supernormal growth stock   **Answer: c Diff: T**

116. The Hart Mountain Company has recently discovered a new type of kitty litter that is extremely absorbent. It is expected that the firm will experience (beginning now) an unusually high growth rate (20 percent) during the period (3 years) it has exclusive rights to the property where the raw material used to make this kitty litter is found. How-ever, beginning with the fourth year the firm's competition will have access to the material, and from that time on the firm will achieve a normal growth rate of 8 percent annually. During the rapid growth period, the firm's dividend payout ratio will be relatively low (20 percent) in order to conserve funds for reinvestment. However, the decrease in growth in the fourth year will be accompanied by an increase in the dividend payout to 50 percent. Last year's earnings were $E_0 = \$2.00$ per share, and the firm's required return is 10 percent. What should be the current price of the common stock?

   a. $66.50
   b. $87.96
   c. $71.54
   d. $61.78
   e. $93.50

Nonconstant growth stock   **Answer: b Diff: T**

117. Club Auto Parts' last dividend, D_0, was $0.50, and the company expects to experience no growth for the next 2 years. However, Club will grow at an annual rate of 5 percent in the third and fourth years, and, beginning with the fifth year, it should attain a 10 percent growth rate that it will sustain thereafter. Club has a required rate of return of 12 percent. What should be the price per share of Club stock at the end of the second year, $\hat{P}_2$?

   a. $19.98
   b. $25.08
   c. $31.21
   d. $19.48
   e. $27.55

Nonconstant growth stock   **Answer: e Diff: T**

118. Modular Systems Inc. just paid dividend D_0, and it is expecting both earnings and dividends to grow by 0 percent in Year 2, by 5 percent in Year 3, and at a rate of 10 percent in Year 4 and thereafter. The required return on Modular is 15 percent, and it sells at its equilibrium price, P_0 = $49.87. What is the expected value of the next dividend, D_1? (Hint: Draw a time line and then set up and solve an equation with one unknown, D_1.)

   a. It cannot be estimated without more data.
   b. $1.35
   c. $1.85
   d. $2.35
   e. $2.85

Nonconstant growth stock   **Answer: c Diff: T**

119. A financial analyst has been following Fast Start Inc., a new high-growth company. She estimates that the current risk-free rate is 6.25 percent, the market risk premium is 5 percent, and that Fast Start's beta is 1.75. The current earnings per share (EPS_0) are $2.50. The company has a 40 percent payout ratio. The analyst estimates that the company's dividend will grow at a rate of 25 percent this year, 20 percent next year, and 15 percent the following year. After three years the dividend is expected to grow at a constant rate of 7 percent a year. The company is expected to maintain its current payout ratio. The analyst believes that the stock is fairly priced. What is the current stock price?

    a. $16.51
    b. $17.33
    c. $18.53
    d. $19.25
    e. $19.89

Stock growth rate   **Answer: b Diff: T**

120. Mulroney Motors' stock has a required return of 10 percent. The stock currently trades at $50 per share. The year-end dividend, D_1, is expected to be $1.00 per share. After this payment, the dividend is expected to grow by 25 percent per year for the next three years. That is, $D_4 = \$1.00(1.25)^3 = \$1.953125$. After t = 4, the dividend is expected to grow at a constant rate of X percent per year forever. What is the stock's expected constant growth rate after t = 4? In other words, what is X?

    a. 5.47%
    b. 6.87%
    c. 6.98%
    d. 8.00%
    e. 8.27%

Preferred stock value   **Answer: d Diff: T**

121. Assume that you would like to purchase 100 shares of preferred stock that pays an annual dividend of $6 per share. However, you have limited resources now, so you cannot afford the purchase price. In fact, the best that you can do now is to invest your money in a bank account earning a simple interest rate of 6 percent, but where interest is compounded daily (assume a 365-day year). Because the preferred stock is riskier, it has a required annual rate of return of 12 percent. (Assume that this rate will remain constant over the next 5 years.) For you to be able to purchase this stock at the end of 5 years, how much must you deposit in your bank account today, at t = 0?

    a. $2,985.00
    b. $4,291.23
    c. $3,138.52
    d. $3,704.18
    e. $4,831.25

Firm value   **Answer: c Diff: T**

122. Assume an all equity firm has been growing at a 15 percent annual rate and
      is expected to continue to do so for 3 more years. At that time, growth is
      expected to slow to a constant 4 percent rate. The firm maintains a 30
      percent payout ratio, and this year's retained earnings net of dividends
      were $1.4 million. The firm's beta is 1.25, the risk-free rate is 8
      percent, and the market risk premium is 4 percent. If the market is in
      equilibrium, what is the market value of the firm's common equity (1
      million shares outstanding)?

      a. $ 6.41 million
      b. $12.96 million
      c. $ 9.17 million
      d. $10.56 million
      e. $ 7.32 million

Multiple Part:

        (The following information applies to the next two problems.)

Bridges & Associates' stock is expected to pay a $0.75 per-share dividend at the
end of the year. The dividend is expected to grow 25 percent the next year and
35 percent the following year. After t = 3, the dividend is expected to grow at
a constant rate of 6 percent a year. The company's cost of common equity is 10
percent and it is expected to remain constant.

Stock price--nonconstant growth   **Answer: b Diff: M N**

123. What is the expected price of the stock today?

      a. $18.75
      b. $27.61
      c. $30.77
      d. $34.50
      e. $35.50

Future stock price--constant growth   **Answer: c Diff: M N**

124. What is the expected price of the stock 10 years from today?

      a. $47.58
      b. $49.45
      c. $50.43
      d. $53.46
      e. $55.10

(The following information applies to the next two problems.)

An analyst has put together the following spreadsheet to estimate the intrinsic value of the stock of Rangan Company (in millions of dollars):

	t = 1	t = 2	t = 3
Sales	$3,000	$3,600	$4,500
NOPAT	500	600	750
Net investment in operating capital*	300	400	500

*Net investment in operating capital = Capital expenditures + Changes in net operating capital – Depreciation.

After Year 3 (t = 3), assume that the company's free cash flow will grow at a constant rate of 7 percent a year and the company's WACC equals 11 percent. The market value of the company's debt and preferred stock is $700 million. The company has 100 million outstanding shares of common stock.

Free cash flow   **Answer: b Diff: E N**

125. What is the company's free cash flow the first year (t = 1)?

    a. $100 million
    b. $200 million
    c. $300 million
    d. $400 million
    e. $500 million

FCF model for valuing stock   **Answer: b Diff: M N**

126. Using the free cash flow model, what is the intrinsic value of the company's stock today?

    a. $46.84
    b. $47.15
    c. $52.87
    d. $58.12
    e. $59.87

(The following information applies to the next two problems.)

An analyst is estimating the intrinsic value of the stock of Xavier Company. The analyst estimates that the stock will pay a dividend of $1.75 a share at the end of the year (that is, $\hat{D}_1$ = $1.75). The dividend is expected to remain at this level until 4 years from now (that is, $\hat{D}_2$ = $\hat{D}_3$ = $\hat{D}_4$ = $1.75). After this time, the dividend is expected to grow forever at a constant rate of 6 percent a year (that is, $\hat{D}_5$ = $1.855). The stock has a required rate of return of 13 percent.

Nonconstant growth stock   **Answer: b Diff: M N**

127. What is the stock's intrinsic value today? (That is, what is $\hat{P}_0$?)

    a. $20.93
    b. $21.46
    c. $22.91
    d. $25.00
    e. $26.50

128.   Assume that the forecasted dividends and the required return are the same
       one year from now, as those forecasted today. What is the expected
       intrinsic value of the stock one year from now, just after the dividend
       has been paid at t = 1? (That is, what is $\hat{P}_1$?)

       a. $20.93
       b. $22.50
       c. $23.75
       d. $24.75
       e. $27.18

CHAPTER 8
ANSWERS AND SOLUTIONS

1. **Required return**   **Answer: e Diff: E**

2. **Required return**   **Answer: d Diff: E**

3. **Required return**   **Answer: a Diff: E**

    The total return is made up of a dividend yield and capital gains yield.
    For Stock A, the total required return is 10 percent and its capital gains
    yield (g) is 7 percent. Therefore, A's dividend yield must be 3 percent.
    For Stock B, the required return is 12 percent and its capital gains yield
    (g) is 9 percent. Therefore, B's dividend yield must also be 3 percent.
    Therefore, statement a is true. Statement b is false. Market efficiency
    just means that all of the known information is already reflected in the
    price, and you can't earn above the required return. This would depend on
    betas, dividends, and the number of shares outstanding. We don't have any
    of that information. Statement c is false. The expected returns of the
    two stocks would be the same only if they had the same betas.

4. **Constant growth model**   **Answer: a Diff: E**

    Statement a is true; the other statements are false. The constant growth
    model is not appropriate for stock valuation in the absence of a constant
    growth rate. If the required rate of return differs for the two firms due
    to risk differences, then the firms' stock prices would differ.

5. **Constant growth model**   **Answer: a Diff: E**

    Statement a is true; the other statements are false. If a stock's required
    return is 12 percent and its capital gains yield is 5 percent, then its
    dividend yield is 12% - 5% = 7%. The expected future dividends should be
    discounted at the required rate of return.

6. **Constant growth model**   **Answer: c Diff: E**

    Statement c is true; the others are false. Statement a would be true only
    if the dividend yield were zero. Statement b is false; we've been given no
    information about the dividend yield. Statement c is true; the constant
    rate at which dividends are expected to grow is also the expected growth
    rate of the stock's price.

7. **Constant growth model**   **Answer: e Diff: E**

Statement a is false: $P_0 = D_1/(k_s - g)$. g is different for the two stocks, but the required return and expected dividend are the same, so the prices will be different also. Statement b is false: $k_s = D_1/P_0 + g$. A has a higher g, so its dividend yield must be lower because the firms have the same required rate of return. Statement c is false. Therefore, statement e is the correct answer.

8. **Constant growth model**   **Answer: c Diff: E N**

The correct answer is statement c.

For Stock X, k_s = $D_1/P_0 + g$
              $0.12 = D_1/P_0 + 0.06$, or $D_1/P_0 = 0.06$.

For Stock Y, k_s = $D_1/P_0 + g$
              $0.10 = D_1/P_0 + 0.04$, or $D_1/P_0 = 0.06$.

So, both Stock X and Stock Y have the same dividend yield. So, statements a and b are incorrect. That also makes statements d and e incorrect. Since both stocks X and Y have the same price today, and Stock X has a higher dividend growth rate than Stock Y, the price of Stock X will be higher than the price of Stock Y one year from today. So, statement c is the correct choice.

9. **Constant growth model**   **Answer: e Diff: E N**

The correct answer is statement e. At a price of $50, $k_s = D_1/P_0 + g = \$3.00/\$50 + 0.06 = 12\%$. So, statement a is correct. $\hat{P}_{10} = \$50(1.06)^{10} = \$89.54$. So, statement b is also correct. $D_1/P_0 = \$3.00/\$50.00 = 6\%$, so statement c is correct. Thus, statement e is the correct choice.

10. **Constant growth model**   **Answer: e Diff: E**

If Stock X has a required return of 12 percent and a dividend yield of 5 percent, we can calculate its growth rate:
 $k_s = D_1/P_0 + g$
$12\% = 5\% + g$
 $7\% = g$.

If Stock Y has a required return of 10 percent and a dividend yield of 3 percent, we can calculate its growth rate:
 $k_s = D_1/P_0 + g$
$10\% = 3\% + g$
 $7\% = g$.

Since both stocks have the same price and Stock X has a higher dividend yield than Stock Y, its dividend per share must be higher. Therefore, statement a is true. We just showed above, that both stocks have the same growth rate, so statement b must be false. One year from now, the stocks will both trade at the same price. They are starting at the same price today, and will be growing at the same rate this year, so they will end up with the same stock price one year from now. Therefore, statement c must also be true. Since both statements a and c are true, the correct choice is statement e.

11. Constant growth model and CAPM   **Answer: a Diff: E N**

The correct answer is statement a. From the information given and the CAPM equation, we know that Stock A's and Stock B's required returns are 12.9% and 11.7%, respectively. The required return is equal to a dividend yield and a capital gains yield. Since these are constant growth stocks, their capital gains yields are equivalent to their dividend growth rates of 7%. Therefore, the dividend yields for Stock A and Stock B are 5.9% and 4.7%, respectively. Statement b is incorrect; we cannot determine which stock has the higher price without knowing their expected dividends. Statement c is incorrect; from the answer given for statement a, we know that Stock B's dividend yield doesn't equal its expected dividend growth rate.

12. Miscellaneous issues   **Answer: c Diff: E**

Statement c is true; the others are false. Two classes of common stock can have different voting rights, as well as pay different dividends. An IPO occurs when a firm goes public for the first time. Statement c is the exact definition of a preemptive right.

13. Preemptive right   **Answer: b Diff: E**

14. Classified stock   **Answer: e Diff: E**

15. Efficient markets hypothesis   **Answer: e Diff: E**

Statements a through d are false; therefore, statement e is true. Statement a is false. Strong-form efficiency states that current market prices reflect all pertinent information, whether publicly available or privately held. If it holds, even insiders would find it impossible to earn abnormal returns in the stock market. Statement b is false; this describes semistrong-form efficiency. Statement c is false; some investors may be able to analyze and react more quickly than others to releases of new information. However, the buy-sell actions of those investors quickly bring market prices into equilibrium.

16. Efficient markets hypothesis   **Answer: d Diff: E**

Stocks are usually riskier than bonds and should have higher expected returns. Therefore, statement a is false. In equilibrium, stocks with more market risk should have higher expected returns than stocks with less market risk. Therefore, statement b is false. The semistrong form of market efficiency says that all publicly available information, including past price history, is already accounted for in the stock's price. Therefore, statement c is false. Remember, when trying to find the price of a stock, we discount all future cash flows by the required return. If the price is equal to the present value of those cash flows, then the NPV of the stock must be equal to 0. Therefore, statement d is true. Net present value is stated in dollars and the required return is stated as a percent. It is impossible for the two to equal each other. Therefore, statement e is false.

17. **Efficient markets hypothesis** **Answer: e** **Diff: E**

Statement a is false; riskier securities have higher required returns. Statement b is false for the same reason as statement a. Statement c is false; semistrong-form efficiency says that you cannot make abnormal profits by trading off publicly available information. So statement e is the correct answer.

18. **Efficient markets hypothesis** **Answer: e** **Diff: E**

Weak-form efficiency means that you cannot profit from recent trends in stock prices (that is, technical analysis doesn't work). Therefore, statement a must be false. Semistrong-form efficiency means that all public information is already accounted for in the stock price. Because bonds and stocks have different risk levels and tax implications, there is no reason to expect them to have the same return. Therefore, statement b must be false. Similarly, because different stocks have different risk levels, there is no reason to expect all stocks to have the same return. Therefore, statement c is also false. The correct choice is statement e.

19. **Efficient markets hypothesis** **Answer: c** **Diff: E**

Statement c is true; the other statements are false. Semistrong-form market efficiency implies that only public information, not private, is rapidly incorporated into stock prices. Markets can be efficient yet still price securities differently depending on their risks.

20. **Efficient markets hypothesis** **Answer: a** **Diff: E**

21. **Efficient markets hypothesis** **Answer: e** **Diff: E N**

The correct answer is statement e. If prices rapidly reflect all available public information, then the market is semistrong-form efficient not weak-form efficient. Therefore, statement a is incorrect. If the market is weak-form efficient, then you cannot beat the market by using technical analysis or charting. Therefore, statement b is incorrect. Different stocks will have different risk and will have different required and expected returns, so statement c is incorrect.

22. **Efficient markets hypothesis** **Answer: a** **Diff: E**

Statement a is true; the other statements are false. Historical information cannot be used to beat the market under weak-form efficiency. Public information cannot be used to beat the market under semistrong-form efficiency.

23. **Preferred stock concepts** **Answer: e** **Diff: E**

24. **Preferred stock concepts** **Answer: e** **Diff: E**

Both statements a and b are true; therefore, statement e is the correct choice. 70 percent of dividends received, not paid out, are tax deductible.

25. **Common stock concepts**   **Answer: d Diff: E**

Statements b and c are true; therefore, statement d is the correct choice. A greater proportion of common stock in the capital structure increases the likelihood of a takeover bid.

26. **Common stock concepts**   **Answer: e Diff: E**

We don't know anything about the dividends of either stock. Stock Y could have a dividend yield of 0 percent and a capital gains yield of 12 percent, while Stock X has a dividend yield of 10 percent and a capital gains yield of 0 percent. Therefore, statement a is false. If the two stocks have the same dividend yield, Stock Y must have a higher expected capital gains yield than X because Y has the higher required return. Therefore, statement b is false. Remember the DCF formula: $P_0 = D_1/(k_s - g)$. If D_1 and g are the same, and we know that Y has a higher required return than X, then Y's dividend yield must be larger than X's. In order for this to be true Y's price must be lower than X's. Therefore, statement c is false. Since statements a, b, and c are false, then the correct answer is statement e.

27. **Declining growth stock**   **Answer: e Diff: E**

Statement e is the correct choice; all the statements are true. Statement a is true; $P_0 = \$2/(0.15 + 0.05) = \$10$. Statement b is true; Div yield$_5$ = D_6/P_5 or $[\$2.00(0.95)^5]/[\$10.00(0.95)^5] = \$1.547562/\$7.74 = 20\%$. Statement c is true; $\$10(0.95)^5 = \$7.74$.

28. **Dividend yield and g**   **Answer: d Diff: E**

$k_s = D_1/P_0 + g$. Both stocks have the same k_s and the same P_0, but may have a different D_1 and a different g. So statements a, b, and c are not necessarily true. Statement d is true, but statement e is clearly false.

29. **Dividend yield and g**   **Answer: c Diff: E**

Statements a and b are both false because the required return consists of both a dividend yield (D_1/P_0) and a growth rate. Statements a and b don't mention the growth rate. Statement c is true because if the required return for Stock A is higher than that of Stock B, and if the dividend yield for Stock A is lower than Stock B's, the growth rate for Stock A must be higher to offset this. Statement d is not necessarily true because the growth rate could go either way depending upon how high the dividend yield is. Statement e is also not necessarily true.

30.   Market equilibrium   **Answer: b Diff: E N**

The correct answer is statement b. The realized return is an historical return. It is what has already happened in the past. There is no reason that the expected return in the future should equal the return it has realized in the past. Therefore, statement a is incorrect. If the expected return does not equal the required return, then markets are not in equilibrium. If you are expecting a higher return than you require (given the level of risk) for a stock, then the stock will be a "bargain." You will be getting a higher return than you require. This disequilibrium will not last, and the stock price will adjust until its expected return equals its required return. Therefore, statement b is correct. Different investments should have different expected returns. You will have a different expected return for an oil company stock than you would for an airline company stock, depending on what is happening to oil prices. There is no reason for you to expect the same returns on all of your investments. Therefore, statement c is incorrect. Investments should not have the same realized returns. Realized returns are historical, and all stocks have different price histories. Therefore, statement d is incorrect.

31.   Market efficiency and stock returns   **Answer: c Diff: M**

Statement c is true; the other statements are false. If beta increased, but g remained the same, the new stock price would be lower. Market efficiency says nothing about the relationship between expected and realized rates of return.

32.   Efficient markets hypothesis   **Answer: e Diff: M**

Statement e is true; the other statements are false. If the stock market is weak-form efficient, you could use private information to outperform the market.   Semistrong-form efficiency means that current market prices reflect all publicly available information.

33.   Efficient markets hypothesis   **Answer: c Diff: M**

34.   Efficient markets hypothesis   **Answer: e Diff: M**

Statement e is the correct choice. Semistrong-form efficiency implies that past stock prices cannot be used to forecast future returns.

35.   Efficient markets hypothesis   **Answer: d Diff: M**

36.   Market equilibrium   **Answer: a Diff: M**

37.   Ownership and going public   **Answer: c Diff: M**

38.   Dividend yield and g   **Answer: b Diff: M**

Statement b is true; the other statements are false. The stock's required return must equal the sum of its expected dividend yield and constant growth rate. A stock's dividend yield can exceed the expected growth rate.

39. Constant growth model   **Answer: d Diff: M**

Statement d is true; the other statements are false. k_s = Dividend yield + Capital gains. 14% = Dividend yield + 8%; therefore, Dividend yield = 6%. Dividend yield = Dividend/Price; Dividend = 0.06 × $50 = $3. Future stock price = $50 × 1.08 = $54.

40. Preferred stock value   **Answer: d Diff: E**

$V_p = D_p/k_p = \$5/0.20 = \$25.$

41. Preferred stock value   **Answer: d Diff: E**

The dividend is calculated as 10% × $120 = $12. We know that the cost of preferred stock is equal to the dividend divided by the stock price or 8% = $12/Price. Solve this expression for Price = $150. (Note: Non-participating preferred stockholders are entitled to just the stated dividend rate. There is no growth in the dividend.)

42. Preferred stock yield   **Answer: c Diff: E**

Annual dividend = $2.50(4) = $10.
$k_p = D_p/V_p = \$10/\$50 = 0.20 = 20\%.$

43. Preferred stock yield   **Answer: a Diff: E**

Annual dividend = $0.50(4) = $2.00.
$k_p = D_p/V_p = \$2.00/\$20.00 = 0.10 = 10\%.$

44. Stock price   **Answer: d Diff: E**

```
    0  k_s = 16%   1              2  Years
    ├───────────────┼──────────────┤
P0 = ?              0          D2 = 9.25
                               P̂2 = 150.00
                               CF2 = 159.25
```

Numerical solution:
$$P_0 = \frac{\$159.25}{(1.16)^2} = \$118.35.$$

Financial calculator solution:
Inputs: N = 2; I = 16; PMT = 0; FV = 159.25. Output: PV = -$118.35.
$P_0 = \$118.35.$

45. Future stock price--constant growth   **Answer: d Diff: E**

The stock price will grow at 7 percent for 4 years, $25 × $(1.07)^4$ = $32.77.

46.   Future stock price--constant growth   **Answer: b   Diff: E**

The stock price today is calculated as:
$4/(0.12 - 0.08) = $100.   If the growth rate is 8 percent, the price in 8 years will be: $100 \times (1.08)^8 = $185.09.

47.   Future stock price--constant growth   **Answer: a   Diff: E**

Step 1:   Find g:
$$P_0 = D_1/(k_s - g)$$
$$\$20 = \$2/(0.15 - g)$$
$$g = 5\%.$$

Step 2:   Find P at t = 7:
$$\hat{P}_7 = P_0(1 + g)^7$$
$$\hat{P}_7 = \$20(1.05)^7$$
$$\hat{P}_7 = \$28.14 \approx \$28.$$

48.   Future stock price--constant growth   **Answer: a   Diff: E**

Step 1:   Determine the constant growth rate, g:
$$k_s = D_1/P_0 + g$$
$$9\% = \$2/\$40 + g$$
$$0.09 = 0.05 + g$$
$$0.04 = g.$$

Step 2:   Determine the expected price of the stock 5 years from today:
$$\hat{P}_5 = P_0 \times (1 + g)^n$$
$$= \$40 \times (1.04)^5$$
$$= \$40 \times 1.21665$$
$$= \$48.67.$$

49.   Future stock price--constant growth   **Answer: e   Diff: E   N**

The price today, $P_0 = \dfrac{\hat{D}_1}{k_s - g} = \dfrac{\$0.50}{0.12 - 0.07} = \$10.00.$

Since this is a constant growth stock, its price will grow at the same rate as dividends.   So, $\hat{P}_4 = P_0(1.07)^4 = \$10.00(1.07)^4 = \$13.108 \approx \$13.11.$

50.   Constant growth stock   **Answer: b   Diff: E**

$$k_s = D_1/P_0 + g$$
$$g = k_s - D_1/P_0$$
$$g = 0.11 - \$1/\$20 = 0.06 = 6\%.$$

51.   Constant growth stock   **Answer: a   Diff: E**

$$P_0 = \frac{\$2.00(1.15)}{0.19 - 0.15} = \$57.50.$$

52.   Constant growth stock   **Answer: e   Diff: E**

The required rate of return on the stock: 5% + (9% − 5%)1.3 = 10.2%.
D_1 = $2.40 × 1.06 = $2.544.
The price of the stock today is $2.544/(0.102 − 0.06) = $60.57.

53.   Constant growth stock   **Answer: c   Diff: E**

$$P_0 = D_1/(k_s - g)$$
$$\$30 = \$3/(0.16 - g)$$
$$\$4.8 - \$30g = \$3$$
$$\$1.8 = \$30g$$
$$g = 6\%.$$

54.   Constant growth stock   **Answer: d   Diff: E**

We know that $P_0 = D_1/k_s − g$) and we have all the information except D_1, so we input the data into this equation.
$30 = D_1/(0.10 − 0.07)
$30 = 33.33$D_1$
  D_1 = $0.90.

55.   Constant growth stock   **Answer: b   Diff: E**

Step 1: Calculate the price of the stock today, since it is a constant growth stock.
        D_1 = $2.00; k_s = 0.09; g = 0.05.
        $P_0 = D_1/(k_s − g)$
           = $2.00/(0.09 − 0.05)
           = $50.

Step 2: Determine the price of the stock five years from today:
        $\hat{P}_5$ = $50 × $(1.05)^5$ = $63.81.

56.   Constant growth stock   **Answer: d   Diff: E**

Step 1: Using the Gordon constant growth model, calculate today's price:
        $P_0 = D_1/(k_s − g)$
           = $0.60/(0.12 − 0.07)
           = $12.00.

Step 2: Calculate the price of the stock 5 years from today, assuming g = 7% per year:
        $\hat{P}_5$ = $P_0 × (1.07)^5$
           = $12.00 × $(1.07)^5$
           = $16.83.

57. **Constant growth stock**   Answer: b Diff: E N

This is a constant growth stock, so you can use the Gordon constant growth model to calculate today's price. Once you have today's price, you can find the price in 10 years.

Step 1: Find the stock's current price.
$$P_0 = D_1/(k_s - g)$$
$$= \$0.45/(0.11 - 0.04)$$
$$= \$6.4286.$$

Step 2: Find the stock's price in 10 years, given its current stock price.
$$\hat{P}_{10} = P_0(1 + g)^n$$
$$= \$6.4286(1.04)^{10}$$
$$= \$9.52.$$

58. **Nonconstant growth stock**   Answer: d Diff: E

```
     0      k = 12%      1                2          3  Years
     |   gs = 5%         |    gs = 5%     |  gn = 10%  |
    1.00               1.05           1.1025       1.21275
P0 = ?                            P̂2 = 60.6375 =  1.21275
CFt  0                  1.05          61.7400    ─────────────
                                                 0.12 − 0.10
```

Numerical solution:
$$P_0 = \frac{\$1.05}{1.12} + \frac{\$61.74}{(1.12)^2} = \$50.16.$$

Financial calculator solution:
Enter in CFLO register $CF_0 = 0$, $CF_1 = 1.05$, and $CF_2 = 61.74$.
Then enter I = 12, and press NPV to get NPV = P_0 = \$50.16.

59. **Nonconstant growth stock**   Answer: d Diff: E

Time line:
```
     0     k = 10%   1         2          3          4  Years
     |  g1 = 4%      |  g2 = 5% |  g3 = 6%  |  gn = 7% |
    2.00           2.08      2.1840     2.31504    2.4770928
P0 = ?

                               P̂3 = 82.56976 =  2.4770928
                                               ─────────────
                                               0.10 − 0.07
CFt  0            2.08      2.1840     84.88480
```

Numerical solution:
$$P_0 = \frac{\$2.08}{1.10} + \frac{\$2.1840}{(1.10)^2} + \frac{\$84.8848}{(1.10)^3} = \$67.47.$$

Enter in calculator:
$CF_0 = 0$; $CF_1 = 2.08$; $CF_2 = 2.1840$; and $CF_3 = 84.8848$; I = 10; and press NPV to get NPV = P_0 = \$67.47.

60.   Beta coefficient   **Answer: b Diff: E**

Step 1:   Find k_s:
$k_s = D_1/P_0 + g$
$k_s = \$2/\$40 + 0.07$
$k_s = 0.12$.

Step 2:   Use the CAPM to find beta:
$k_s = k_{RF} + (k_M - k_{RF})b$
$0.12 = 0.06 + 0.06(b)$
$b = 1$.

61.   New issues and dilution   **Answer: b Diff: E**

Calculate current and new market value of firm after new stock issue:
1,000 shares × \$100 per share   =   \$100,000
Plus 1,000 new shares @ \$90 each   +   90,000
New firm market value $\underline{\$190,000}$

Calculate new market share price:
\$190,000/2,000 shares = \$95.00 per share
Dilution: Old shareholders lose \$100 - \$95 = \$5.00 per share.

62.   FCF model for valuing stock   **Answer: d Diff: E N**

Firm value = \$25,000,000/(0.10 - 0.07) = \$833,333,333. This is the value
of the whole company, including debt, preferred stock, and common stock.
From this, we subtract the \$200,000,000 in debt and preferred stock. This
leaves an equity value of \$833,333,333 - \$200,000,000 = \$633,333,333.

So, the price/share = $\dfrac{\$633,333,333}{30,000,000}$ = \$21.11.

63.   FCF model for valuing stock   **Answer: d Diff: E N**

FCF_1 = \$300,000,000, growth rate = 7%, and WACC = 11%.

Firm value = FCF_1/(WACC - g)
= \$300,000,000/(0.11 - 0.07) = \$7,500,000,000.

Total MV assets = MV debt + MV pref. stock + MV common equity
\$7,500,000,000 = \$500,000,000 + MV common equity
\$7,000,000,000 = MV common equity.

$\hat{P}_0$ = MV equity/# of shares
$\hat{P}_0$ = \$7,000,000,000/150,000,000
$\hat{P}_0$ = \$46.67.

64.   **Changing beta and the equilibrium stock price**   Answer: d   Diff: M

Step 1:   Solve for D_1: $D_0 = 0.40 \times E_0 = 0.40 \times \$4.00 = \$1.60$, since the firm has a 40% payout ratio. $D_1 = D_0(1 + g) = \$1.60(1.06) = \$1.6960$.

Step 2:   Solve for the original k_s: $k_s = D_1/P_0 + g = \$1.6960/\$30 + 6\% = 11.65\%$.

Step 3:   Solve for the original beta using the CAPM formula: $11.65\% = 8\% + (5\%)b_0$; $b_0 = 0.7300$.

Step 4:   Solve for the new beta: $b_1 = 1.5 \times b_0 = 1.5 \times 0.7300 = 1.0950$.

Step 5:   Solve for the new k_s using the CAPM: $k_s = 8\% + (5\%)1.0950 = 13.4750\%$.

Step 6.   Solve for $P_0 = D_1 / (k_s - g) = \$1.6960/(0.13475 - 0.06) = \$22.69$.

65.   **Equilibrium stock price**   Answer: b   Diff: M

Before: $k_s = 5\% + (8\% - 5\%)1.3 = 8.9\%$.
$$P_0 = \frac{\$0.80(1.04)}{0.089 - 0.04} = \$16.98.$$

After: $k_s = 4\% + (10\% - 4\%)1.5 = 13\%$.
$$P_0 = \frac{\$0.80(1.06)}{0.130 - 0.06} = \$12.11.$$

Hence, we have $\$12.11 - \$16.98 = -\$4.87$.

66.   **Constant growth stock**   Answer: d   Diff: M

To find the stock price seven years from today, we need to find the growth rate.

Step 1:   Calculate the required rate of return:
$k_s = k_{RF} + (k_M - k_{RF})b$
$\quad = 5\% + (5\%)1.2$
$\quad = 11\%$.

Step 2:   Calculate the growth rate using the constant growth formula:
$$P_0 = D_1/(k_s - g)$$
$$\$40 = \$2.00/(0.11 - g)$$
$$\$4.40 - \$40g = \$2.00$$
$$g = \$2.40/\$40.00$$
$$g = 0.06 = 6\%.$$

Step 3:   Determine the expected stock price seven years from today:
$\hat{P}_7 = \$40.00 \times (1.06)^7 = \$60.1452 \approx \$60.15$.

67. Constant growth stock   **Answer: c Diff: M N**

First, we must determine the firm's required return:
$k_s = k_{RF} + (k_M - k_{RF})b$
$k_s = 5\% + (7\%)1.2$
$k_s = 13.4\%$.

Using the required return, we can determine the constant dividend growth rate:
$k_s = D_1/P_0 + g$
$0.134 = \$2/\$40 + g$
$0.134 = 0.05 + g$
$0.084 = g$.

Now, that we have the constant growth rate, we can find the stock's expected price in Year 5:
$\hat{P}_5 = P_0(1 + g)^t$
$\hat{P}_5 = \$40(1.084)^5$
$\hat{P}_5 = \$59.87$.

68. Nonconstant growth stock   **Answer: a Diff: M**

Time line:

0		1	2	3	4	5 Years
	$k_s = 18\%$					
	$g_s = 20\%$	$g_s = 20\%$	$g_s = 20\%$	$g_s = 20\%$	$g_n = 0\%$	
1.50		1.80	2.16	2.592	3.1104	3.1104

$P_0 = ?$
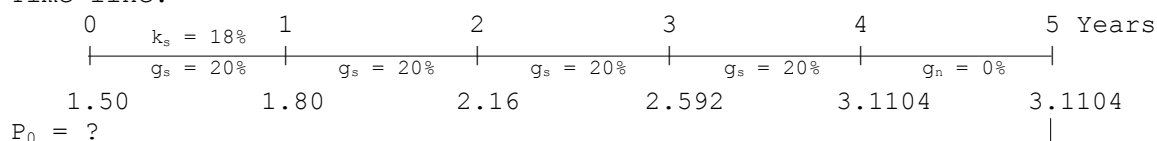
$$\hat{P}_4 = \frac{3.1104}{0.18 - 0} = \underline{17.2780}$$

CF_t	$\underline{0}$	$\underline{1.80}$	$\underline{2.16}$	$\underline{2.592}$	$\underline{20.3884}$

Required rate of return: $k_s = 4\% + (12.75\% - 4\%)1.6 = 18\%$.

Financial calculator solution:
Inputs: $CF_0 = 0$; $CF_1 = 1.80$; $CF_2 = 2.16$; $CF_3 = 2.592$; $CF_4 = 20.3884$; I = 18.
Output: NPV = \$15.17. $P_0 = \$15.17$.

69. Nonconstant growth stock   **Answer: d Diff: M**

The required return on the stock is given by:
$k_s = k_{RF} + RP_M(b)$
$k_s = 5\% + (5\%)1.2 = 11\%$.

The stock price is given by:
$$\hat{P}_4 = \frac{D_5}{k_s - g}$$
$$= \frac{\$1.00}{0.11 - 0.05}$$
$$= \$16.667.$$

Thus, the current price is given by discounting the future price in Year 4 to the present at the required rate of return:
$$P_0 = \frac{\$16.667}{(1.11)^4} = \$10.98.$$

70. **Nonconstant growth stock**   **Answer: d Diff: M**

First, find the stock price after two years:
D_1 = \$1.20.
D_2 = \$1.20 × 1.15 = \$1.38.
D_3 = \$1.38 × 1.05 = \$1.449.

$\hat{P}_2$ = $D_3/(k_s - g)$
   = \$1.449/(0.12 - 0.05)
   = \$20.70.

Next, determine the dividends during the nonconstant growth period:
D_1 = \$1.00 × 1.2 = \$1.20.
D_2 = \$1.20 × 1.15 = \$1.38.

Finally, determine the company's current stock price:
Numerical solution:
$$P_0 = \frac{\$1.20}{1.12} + \frac{\$1.38 + \$20.70}{(1.12)^2} = \$18.67.$$

Financial calculator solution:
Enter in CFLO register CF_0 = 0, CF_1 = 1.20, and CF_2 = 22.08. Then enter I = 12, and press NPV to get NPV = P_0 = \$18.67.

71. **Nonconstant growth stock**   **Answer: a Diff: M**

k_s = k_{RF} + RP_M(b)
   = 8% + 6%(1.5)
   = 17%.

D_1 = \$0.75(1.4) = \$1.05.
D_2 = \$0.75(1.4)^2 = \$1.47.
D_3 = \$0.75(1.4)^3 = \$2.058.
D_4 = \$0.75(1.4)^3(1.15) = \$2.3667.

$\hat{P}_3$ = $D_4/k_s - g$
   = \$2.3667/(0.17 - 0.15)
   = \$118.335.

$$P_0 = \frac{\$1.05}{1.17} + \frac{\$1.47}{(1.17)^2} + \frac{\$2.058 + \$118.335}{(1.17)^3}$$
   = \$77.14.

72. **Nonconstant growth stock**   **Answer: a   Diff: M**

First, find the expected return k_s: k_s = 4% + 6%(1.5) = 13%. (Using the CAPM.)

Next, determine value of the stock at t = 3:
$\hat{P}_3$ = $D_4/(k_s - g)$
   = \$5/(0.13 - 0.08) = \$100.

Finally, find PV of $\hat{P}_3$:
$P_0 = \dfrac{\$100}{(1.13)^3}$ = \$69.305 $\approx$ \$69.31.

73. **Nonconstant growth stock**   **Answer: e   Diff: M**

To find k_s, the return on the stock, we use the CAPM.
k_s = 6% + (11% - 6%) × 1.2 = 12%.

The value of the dividends for Years 1 - 4 are:
D_1 = \$3.00.
D_2 = \$3.00 × 1.25 = \$3.75.
D_3 = \$3.75 × 1.25 = \$4.6875.
D_4 = \$4.6875 × 1.05 = \$4.921875.

The value of the stock at t = 3 is:
$\hat{P}_3$ = $D_4/(k_s - g)$ = \$4.921875/(0.12 - 0.05) = \$70.3125.

Now find the present value of the supernormal growth dividends and the value of the stock at t = 3.
$P_0 = \dfrac{\$3.00}{1.12} + \dfrac{\$3.75}{(1.12)^2} + \dfrac{\$4.6875 + \$70.3125}{(1.12)^3}$
   = \$59.05.

74. **Nonconstant growth stock**   **Answer: b   Diff: M**

We're given D_1, D_2, and D_3 = \$2.25. D_4 and D_5 = \$3.00.   Calculate D_6 as \$3.00 × 1.05 = \$3.15.   The stock price at t = 5 is $\hat{P}_5$ = \$3.15/(0.11 - 0.05) = \$52.50.   The stock price today represents the sum of the present values of D_1, D_2, D_3, D_4, D_5, and $\hat{P}_5$.

$P_0 = \dfrac{\$2.25}{1.11} + \dfrac{\$2.25}{(1.11)^2} + \dfrac{\$2.25}{(1.11)^3} + \dfrac{\$3.00}{(1.11)^4} + \dfrac{\$3.00 + \$52.50}{(1.11)^5}$
   = \$40.41.

75. Nonconstant growth stock   **Answer: b Diff: M**

Step 1:   Calculate D_1 through D_4:
          Since the dividend grows at 10 percent a year for 3 years, D_1 =
          \$3.00, D_2 = \$3.30, and D_3 = \$3.63. The dividend starts to grow at
          5 percent after t = 3, so D_4 = \$3.8115.

Step 2:   Find the stock price at t = 3 when growth becomes constant:
          $\hat{P}_3$ = $D_4/(k_s - g)$
          $\hat{P}_3$ = \$3.8115/(0.11 - 0.05)
          $\hat{P}_3$ = \$63.525.

Step 3:   Find the current stock price:
          The current stock price (at t = 0) is the present value of the
          dividends D_1, D_2, D_3, and the present value of $\hat{P}_3$. Discount these
          values at 11 percent.
          $$P_0 = \frac{\$3.00}{1.11} + \frac{\$3.30}{(1.11)^2} + \frac{\$3.63 + \$63.525}{(1.11)^3}$$
          = \$54.48 ≈ \$54.

76. Nonconstant growth stock   **Answer: e Diff: M**

$$
\begin{array}{c}
2003 \quad {}_{k_s\ =\ 13\%} 2004 \qquad 2005 \qquad 2006 \qquad 2007 \qquad 2008 \qquad 2009 \\
\end{array}
$$

$2003_{k_s = 13\%}$ 2004   2005   2006   2007   2008   2009

|───────|───────|───────|───────|───────|───────|

0     $1.00^{g_s = 20\%}$ $1.20^{g_s = 20\%}$ $1.44^{g_s = 20\%}$ $1.728^{g_n = 7\%}$ 1.84896

P_0 = ? $\dfrac{30.816}{\underline{32.544}} = \dfrac{\$1.84896}{0.13 - 0.07}$

Step 1:   Determine k_s:
          $k_s = k_{RF} + (k_M - k_{RF})b$
             = 6% + 5%(1.4) = 13%.

Step 2:   Calculate the dividends:
          D_{2005} = \$1.00.
          D_{2006} = \$1.00(1.2) = \$1.20.
          D_{2007} = \$1.00(1.2)^2 = \$1.44.
          D_{2008} = \$1.00(1.2)^3 = \$1.728.
          D_{2009} = \$1.00(1.2)^3(1.07) = \$1.84896.

Step 3:   Calculate P_{2008} (when growth becomes constant):
          $$P_{2008} = \frac{D_{2009}}{k_s - g} = \frac{\$1.84896}{0.13 - 0.07}$$

Step 4: $$P_0 = \frac{\$0}{1.13} + \frac{\$1.00}{(1.13)^2} + \frac{\$1.20}{(1.13)^3} + \frac{\$1.44}{(1.13)^4} + \frac{\$1.728 + \$30.816}{(1.13)^5}$$
          = \$20.16.

77. **Nonconstant growth stock** Answer: c Diff: M

Step 1: Calculate the dividends each year:
$D_1 = \$2.00$.
$D_2 = \$2.00 \times 1.25 = \$2.50$.
$D_3 = \$2.50 \times 1.25 = \$3.125$.
$D_4 = \$3.125 \times 1.25 = \$3.90625$.
$D_5 = \$3.90625 \times 1.25 = \$4.8828125$.
$D_6 = \$4.8828125 \times 1.07 = \$5.224609375$.

Step 2: Find the stock's value at Year 5:
$\hat{P}_5 = D_6/(k_s - g)$
$= \$5.224609375/(0.13 - 0.07) = \$87.076823$.

Step 3: Now find the value of the stock in Year 2:
$\hat{P}_2 = \$3.125/1.13 + \$3.90625/(1.13)^2 + (\$4.8828125 + \$87.076823)/(1.13)^3$
$= \$2.7655 + \$3.0592 + \$63.7326$
$= \$69.5573 \approx \$69.56$.

Financial calculator solution:
Step 1: Calculate the dividends each year:
$D_1 = \$2.00$.
$D_2 = \$2.00 \times 1.25 = \$2.50$.
$D_3 = \$2.50 \times 1.25 = \$3.125$.
$D_4 = \$3.125 \times 1.25 = \$3.90625$.
$D_5 = \$3.90625 \times 1.25 = \$4.8828125$.
$D_6 = \$4.8828125 \times 1.07 = \$5.224609375$.

Step 2: Find the stock's value at Year 5:
$\hat{P}_5 = D_6/(k_s - g)$
$= \$5.224609375/(0.13 - 0.07) = \$87.076823$.

Step 3: Now find the value of the stock in Year 2:
Enter the following inputs in the calculator:
$CF_0 = 0$; $CF_1 = 3.125$; $CF_2 = 3.90625$; $CF_3 = 4.8828125 + 87.076823$;
$I = 13$; and then solve for NPV = $\$69.55729 \approx \$69.56$.

78. **Nonconstant growth stock**   **Answer: e Diff: M**

Step 1: Find the cost of equity using the CAPM:
$k_s = k_{RF} + (k_M - k_{RF})b$
= 5.5% + (4% × 1.2) = 10.3%.

Step 2: Determine the dividends during the nonconstant period:
$D_1 - D_4 = \$0$.
$D_5 = \$1.00$.
$D_6 = \$1.00 \times 1.25 = \$1.25$.
$D_7 = \$1.25 \times 1.25 = \$1.5625$.
$D_8 = \$1.5625 \times 1.25 = \$1.953125$.

Step 3: Determine the value of the stock at Year 8:
$\hat{P}_8 = D_9/(k_s - g)$
= ($1.953125 × 1.05)/(0.103 − 0.05)
= $38.694.

Step 4: Calculate the expected price of the stock today:
$P_0 = \$1.00/(1.103)^5 + (1.103)^6 + \$1.5625/(1.103)^7 +$
($1.953125 + $38.694)/$(1.103)^8$
$P_0 = \$0.6125 + \$0.6942 + \$0.7867 + \$18.5535$
$P_0 = \$20.6469 \approx \$20.65$.

79. **Nonconstant growth stock**   **Answer: d Diff: M**

Step 1: Calculate the dividend in Year 4, D_4:
$D_4 = D_3 \times (1 + g)$
= $4.3125 × (1.08)
= $4.6575.

Step 2: Calculate the expected stock price in Year 3, $\hat{P}_3$:
$\hat{P}_3 = D_4/(k_s - g)$
= $4.6575/(0.122 − 0.08)
= $110.8929.

Step 3: Calculate the price of the stock today:
$P_0 = \$3.00/1.122 + \$3.75/(1.122)^2 + (\$4.3125 + \$110.8929)/(1.122)^3$
= $2.6738 + $2.9788 + $81.5632
= $87.2158 ≈ $87.22.

80.   Nonconstant growth stock   **Answer: a Diff: M**

Step 1:   Draw a time line:

$$k_s = 9.8\%$$

0	1	2	3	4	5 Years
	$g_s = 20\%$	$g_s = 20\%$	$g_s = 20\%$	$g_n = 7\%$	
$P_0 = ?$	1.000	1.200	1.440	1.728	1.84896
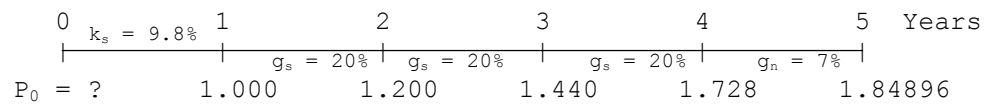
Step 2:   Calculate the dividends for 5 years:
$D_1 = \$1.000$.
$D_2 = \$1 \times 1.2 = \$1.200$.
$D_3 = \$1.20 \times 1.2 = \$1.440$.
$D_4 = \$1.44 \times 1.2 = \$1.728$.
$D_5 = \$1.728 \times 1.07 = \$1.84896$.

Step 3:   Calculate the required rate of return:
$k_s = k_{RF} + (k_M - k_{RF})b$
$\quad = 5\% + (4\%)1.2$
$\quad = 9.8\%$.

Step 4:   Calculate the stock price at the end of Year 4:
$\hat{P}_4 = D_5/(k - g)$
$\quad = \$1.84896/(0.098 - 0.07)$
$\quad = \$66.0343$.

Step 5:   Calculate the price of the stock today:
$\text{NPV} = \$1.000/1.098 + \$1.200/(1.098)^2 + \$1.440/(1.098)^3 + (\$1.7280$
$\qquad + \$66.0343)/(1.098)^4$
$\quad = \$0.9107 + \$0.9954 + 1.0878 + \$46.6207$
$\quad = \$49.6146 \approx \$49.61$.

81.   Nonconstant growth stock   **Answer: d Diff: M**

Step 1:   Draw the time line:

$$k_s = 10\% \qquad g_s = 20\% \qquad g_s = 20\% \qquad g_n = 8\%$$

0	1	2	3	4 Years
P_0 = ?	1.25	1.50	1.80	1.9440

$$\hat{P}_3 = \frac{1.9440}{0.10 - 0.08} = 97.20$$

Step 2:   Calculate the dividends:
$D_1 = \$1.25$.
$D_2 = \$1.25 \times 1.20 = \$1.50$.
$D_3 = \$1.50 \times 1.20 = \$1.80$.
$D_4 = \$1.80 \times 1.08 = \$1.944$.

Step 3:   Calculate the price of the stock at Year 3, when it becomes a constant growth stock:
$\hat{P}_3 = D_4/(k_s - g)$
  $= \$1.944/(0.10 - 0.08)$
  $= \$97.20$.

Step 4:   Calculate the price of the stock today:
$P_0 = (\$1.25/1.10) + \$1.50/(1.10)^2 + (\$1.80 + \$97.20)/(1.10)^3$
  $= \$1.1364 + \$1.2397 + \$74.3802$
  $= \$76.7563 \approx \$76.76$.

82.   Nonconstant growth stock   **Answer: b Diff: M N**

Step 1:   Calculate dividends during the nonconstant period and the first year of constant growth:
$D_1 = \$1.00$.
$D_2 = \$1.00 \times 1.25 = \$1.25$.
$D_3 = \$1.00 \times (1.25)^2 = \$1.5625$.
$D_4 = \$1.00 \times (1.25)^2 \times 1.06 = \$1.65625$.

Step 2:   Calculate the price of the stock once growth is constant (which would be at the end of the third year).

$$\hat{P}_3 = \frac{D_4}{k_s - g} = \frac{\$1.65625}{0.11 - 0.06} = \$33.125.$$

Step 3: $P_0 = \dfrac{\$1.00}{1.11} + \dfrac{\$1.25}{(1.11)^2} + \dfrac{(\$33.125 + \$1.5625)}{(1.11)^3}$
  $= \$0.9009 + \$1.0145 + \$25.3632$
  $= \$27.2786 \approx \$27.28$.

Alternatively, enter the nonconstant dividends and the stock price at the point of time when growth becomes constant into your calculator as follows:
$CF_0 = 0$; $CF_1 = 1.00$; $CF_2 = 1.25$; $CF_3 = 33.125 + 1.5625 = 34.6875$; $I = 11$; and then solve for NPV = $P_0 = \$27.28$.

83. **Nonconstant growth stock**   **Answer: c Diff: M**

Time line:

```
      0      k_s = 15%   1            2            3          4 Years
      ├──────────────────┼────────────┼────────────┼────────────┤
             g_s = 25%       g_s = 25%     g_s = 25%      g_n = 10%
      3.00              3.75        4.6875       5.859375    6.4453125
P_0 = ?
```

$$\hat{P}_3 = \underline{128.90625} = \frac{6.4453125}{0.15 - 0.10}$$

CF_t <u>0</u>   <u>3.75</u>   <u>4.6875</u>   <u>134.765625</u>

Step 1: Find the dividend stream to D_3:
         $D_0 = \$3.00$;
         $D_1 = (\$3.00)(1.25) = \$3.7500$
         $D_2 = (\$3.75)(1.25) = \$4.6875$
         $D_3 = (\$4.6875)(1.25) = \$5.859375$

Step 2: Find $\hat{P}_3$:
         $$\hat{P}_3 = \frac{D_3(1 + g)}{k_s - g} = \frac{(\$5.859375)(1.10)}{0.15 - 0.10} = \$128.90625.$$

Step 3: Find the NPV of the cash flows, the stock's value:
         $CF_0 = 0$; $CF_1 = 3.7500$; $CF_2 = 4.6875$; $CF_3 = 134.765625$; $I = 15$; and
         then solve for NPV = \$95.42.

84. Nonconstant growth stock   **Answer: a   Diff: M**

Time line:

```
   0  kₛ = 11%    5              6              7              8   Years
   ├──────●●●────┼──────────────┼──────────────┼──────────────┤
                    gₛ = 25%       gₛ = 25%        gₙ = 10%
   P₀ = ?          1.00           1.25           1.5625         1.71875
```

$$\hat{P}_7 = 171.875 = \frac{1.71875}{0.01}$$
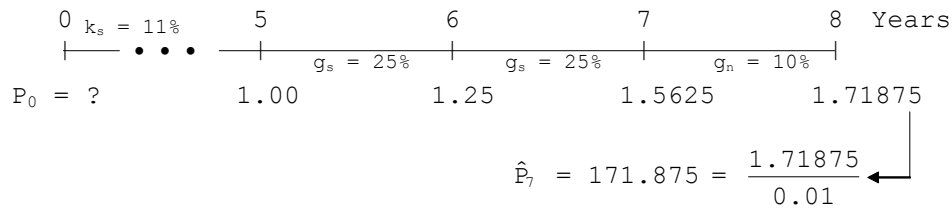
Step 1: Determine the dividends to be received:
$D_5 = \$1.00.$
$D_6 = \$1.00 \times 1.25 = \$1.2500.$
$D_7 = \$1.25 \times 1.25 = \$1.5625.$
$D_8 = \$1.5625 \times 1.10 = \$1.71875.$

Step 2: Determine the value of the stock once dividend growth is constant:

$$\hat{P}_7 = \frac{D_8}{k_s - g}$$

$$\hat{P}_7 = \frac{\$1.71875}{0.11 - 0.10}$$

$$\hat{P}_7 = \$171.875.$$

Step 3: Determine the price of the stock today:
As an investor today, you would be entitled to D_5, D_6, D_7, and $\hat{P}_7$.
Enter the following input data in your calculator:
$CF_0 = 0$; $CF_{1-4} = 0$; $CF_5 = 1.00$; $CF_6 = 1.25$; $CF_7 = 1.5625 + 171.875 = 173.4375$; $I = 11$; and then solve for NPV = $84.80.

85.   Nonconstant growth stock   **Answer: a Diff: M N**

Time line:

```
    0          k_s = 12%    1            2            3            4            5 Years
    |                       |            |            |            |            |
              g_s = 25%        g_s = 25%    g_s = 25%    g_s = 25%    g_n = 5%
    1.00                   1.25         1.5625       1.9531       2.4414       2.5635
P_0 = ?
```
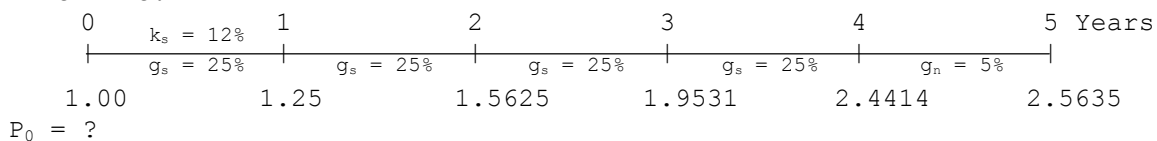
$$\hat{P}_4 = \underline{36.6211} = \frac{2.5635}{0.12 - 0.05}$$

CF_t $\underline{0}$ $\underline{1.25}$ $\underline{1.5625}$ $\underline{1.9531}$ $\underline{39.0625}$

Step 1: Calculate the dividends during the nonconstant growth period and the first dividend after that period.
$D_1 = D_0(1 + g) = \$1.00(1.25) = \$1.2500$.
$D_2 = D_1(1 + g) = \$1.25(1.25) = \$1.5625$.
$D_3 = D_2(1 + g) = \$1.5625(1.25) = \$1.9531$.
$D_4 = D_3(1 + g) = \$1.9531(1.25) = \$2.4414$.
$D_5 = D_4(1 + g) = \$2.4414(1.05) = \$2.5635$.

Step 2: Calculate the stock price when the stock's growth rate becomes constant.
$\hat{P}_4 = D_5/(k_s - g)$
$= \$2.5635/(0.12 - 0.05)$
$= \$36.6211$.

Step 3: Using your financial calculator, enter the cash flows to determine the stock's current price.
$CF_0 = 0$; $CF_1 = 1.25$; $CF_2 = 1.5625$; $CF_3 = 1.9531$; $CF_4 = 39.0625$; $I = 12$. Solve for NPV $= \$28.5768 \approx \$28.58$.

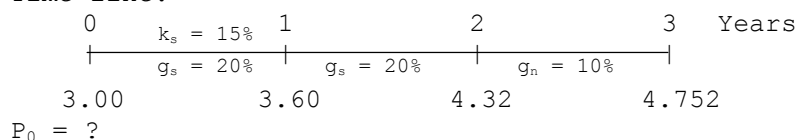**86.   Supernormal growth stock**   **Answer: e Diff: M**

The data in the problem are unrealistic and inconsistent with the require-ments of the growth model; k less than g implies a negative stock price. If k equals g, the denominator is zero, and the numerical result is undefined. k must be greater than g for a reasonable application of the model.

87.   Supernormal growth stock   **Answer: b   Diff: M**

Time line:

```
     0        ks = 15%   1             2             3    Years
     ├──────────────────┼─────────────┼─────────────┤
          gs = 20%         gs = 20%       gn = 10%
     3.00              3.60          4.32          4.752
```

P_0 = ?

$$\hat{P}_2 = \underline{95.04} = \frac{4.752}{0.15 - 0.10}$$

CF_t $\underline{0}$ $\underline{3.60}$ $\underline{99.36}$

$k_s = 0.07 + (0.11 - 0.07)2.0 = 0.15 = 15\%$.

Numerical solution:

$$P_0 = \frac{\$3.60}{1.15} + \frac{\$99.36}{(1.15)^2} = \$78.26.$$

$$\text{Dividend yield} = \frac{D_1}{P_0} = \frac{\$3.60}{\$78.26} = 4.60\%.$$

Financial calculator solution:
Inputs: $CF_0 = 0$; $CF_1 = 3.60$; $CF_2 = 99.36$; I = 15.
Output: NPV = $78.26.

Dividend yield = $3.60/$78.26 = 0.0460 = 4.60%.

88.   Supernormal growth stock   **Answer: b   Diff: M**

Time line:

```
     0        ks = 18%   1             2             3          4 Years
     ├──────────────────┼─────────────┼─────────────┼──────────┤
          gs = 15%                                    gn = 6%
     0                  0             0            2.00        2.12
```

P_0 = ?
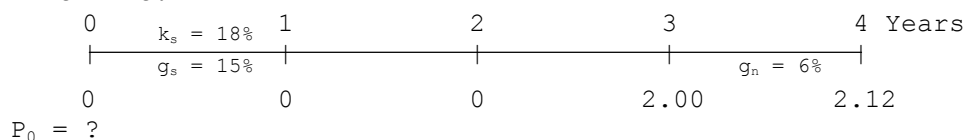
$$\hat{P}_3 = \underline{17.667} = \frac{2.12}{0.18 - 0.06}$$

CF_t $\underline{0}$ $\underline{0}$ $\underline{0}$ $\underline{19.667}$

Numerical solution:

$$\hat{P}_0 = \frac{\$0}{1.18} + \frac{\$0}{(1.18)^2} + \frac{\$19.667}{(1.18)^3} = \$11.97.$$

$P_0 > \hat{P}_0$. Stock is overvalued: $15.00 - $11.97 = $3.03.

Financial calculator solution:
Calculate current expected price of stock, $\hat{P}_0$:
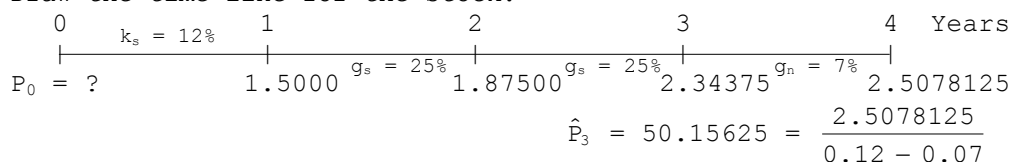Inputs: $CF_0 = 0$; $CF_1 = 0$; $N_j = 2$; $CF_2 = 19.667$; I = 18.
Output: NPV = $11.97. $\hat{P}_0 = \$11.97$.
$P_0 > \hat{P}_0$. Stock is overvalued: $15.00 - $11.97 = $3.03.

89. Supernormal growth stock   **Answer: b Diff: M**

Step 1: Draw the time line for the stock:

$$
\begin{array}{ccccc}
0 & 1 & 2 & 3 & 4 \quad \text{Years}
\end{array}
$$

$k_s = 12\%$

$P_0 = ?$ 1.5000 $g_s = 25\%$ 1.87500 $g_s = 25\%$ 2.34375 $g_n = 7\%$ 2.5078125

$$\hat{P}_3 = 50.15625 = \frac{2.5078125}{0.12 - 0.07}$$

Step 2: Calculate the stock's dividends for Years 2-4:
$D_2 = \$1.50 \times 1.25 = \$1.8750$.
$D_3 = \$1.8750 \times 1.25 = \$2.34375$.
$D_4 = \$2.34375 \times 1.07 = \$2.5078125$.

Step 3: Calculate the stock's expected price in Year 3:
$\hat{P}_3 = D_4/(k_s - g)$
$\quad = \$2.5078125/(0.12 - 0.07)$
$\quad = \$50.15625$.

Step 4: Calculate the value of the stock today:
As an investor today, you will get D_1, D_2, D_3, and can sell the stock at $t = 3$ for \$50.15625.
$$P_0 = \frac{\$1.50}{1.12} + \frac{\$1.875}{(1.12)^2} + \frac{\$2.34375 + \$50.15625}{(1.12)^3}$$
$\quad = \$1.3393 + \$1.4947 + \$37.3685$
$\quad = \$40.2025 \approx \$40.20$.

90. Supernormal growth stock   **Answer: b Diff: M**

Time line:

$$
\begin{array}{ccccc}
0 & 1 & 2 & 3 \quad \text{Years}
\end{array}
$$

$k_s = 9\%$
$g_1 = 40\%$ $g_2 = 25\%$ $g_n = 5\%$

   2.00   2.80   3.50   3.675

$P_0 = ?$ $\hat{P}_2 = \dfrac{3.675}{0.09 - 0.05} = \underline{91.875}$

CF_t $\underline{0}$ $\underline{2.80}$ $\underline{95.375}$
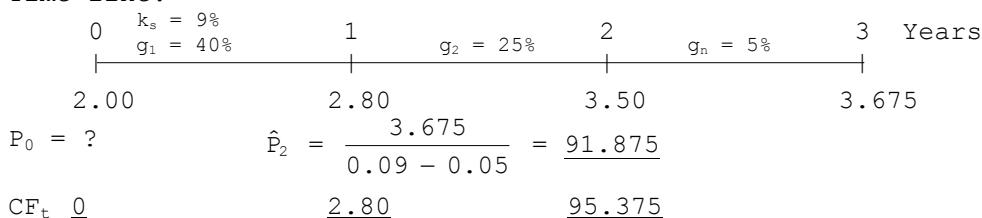
k_s = Dividend yield + g = $0.04 + 0.05 + 0.09 \approx 9\%$.

Numerical solution:
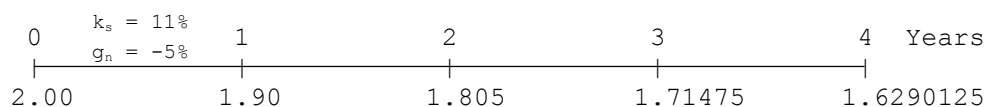$$P_0 = \frac{\$2.80}{1.09} + \frac{\$95.375}{(1.09)^2} = \$82.84.$$

Financial calculator solution:
Inputs: $CF_0 = 0$; $CF_1 = 2.80$; $CF_2 = 95.375$; I = 9.
Output: NPV = \$82.84; $P_0 = \$82.84$.

91. Declining growth stock   **Answer: d Diff: M**

Time line:

0	$k_s = 11\%$	1	2	3	4 Years
	$g_n = -5\%$				

2.00   1.90   1.805   1.71475   1.6290125

$$\hat{P}_0 = \frac{\$1.90}{0.11 - (-0.05)} = \frac{\$1.90}{0.16} = \$11.875.$$

$$\hat{P}_3 = \$11.875(0.95)^3 = \$10.18.$$

92. Stock growth rate   **Answer: d Diff: M**

Required rate of return: $k_s = 11\% + (14\% - 11\%)0.5 = 12.5\%$.

Calculate growth rate using k_s:

$$P_0 = \frac{D_0(1 + g)}{k_s - g}$$

$$\$48 = \frac{\$2(1 + g)}{0.125 - g}$$

$$\$6 - \$48g = \$2 + \$2g$$
$$\$50g = \$4$$
$$g = 0.08 = 8\%.$$

Required return equals total yield (Dividend yield + Capital gains yield).
Dividend yield = $\$2.16/\$48.00 = 4.5\%$; Capital gains yield = $g = 8\%$.

93. Stock growth rate   **Answer: e Diff: M**

The required rate of return on the stock is $9\% + (6\%)0.8 = 13.8\%$. Using
the constant growth model, we can solve for the growth rate as follows:

$$\$40 = \frac{\$2(1 + g)}{0.138 - g}$$

$$\$5.52 - \$40g = \$2 + \$2g$$
$$\$42g = \$3.52$$
$$g = 8.38\%.$$

94. **Capital gains yield** **Answer: c** **Diff: M**

Step 1: Calculate k_s, the required rate of return:

$$k_s = \frac{\$2}{\$20} + 6\% = 10\% + 6\% = 16\%.$$

Step 2: Calculate k_{RF}, the risk-free rate:

$$16\% = k_{RF} + (15\% - k_{RF})1.2$$
$$16\% = k_{RF} - 1.2k_{RF} + 18\%$$
$$0.2k_{RF} = 2\%$$
$$k_{RF} = 10\%.$$

Step 3: Calculate the new stock price and capital gain:

New $k_s = 10\% + (15\% - 10\%)0.6 = 13\%.$

$$\hat{P}_{New} = \frac{\$2}{0.13 - 0.06} = \$28.57.$$

Therefore, the percentage capital gain is 43% calculated as follows:

$$\frac{\$28.57 - \$20.00}{\$20.00} = \frac{\$8.57}{\$20.00} = 0.4285 \approx 43\%.$$

95. **Capital gains yield** **Answer: d** **Diff: M**

Required rate of return, $k_s = 8\% + (15\% - 8\%)0.6 = 12.2\%.$
Calculate dividend yield and use to calculate capital gains yield:

$$\text{Dividend yield} = \frac{D_1}{P_0} = \frac{\$2.00}{\$25.00} = 0.08 = 8\%.$$

Capital gains yield = Total yield - Dividend yield = 12.2% - 8% = 4.2%.

Alternative method:

$$P_0 = \frac{D_1}{k_s - g}$$
$$\$25 = \frac{\$2.00}{0.122 - g}$$
$$\$3.05 - \$25g = \$2.00$$
$$\$25g = \$1.05$$
$$g = 0.042 = 4.2\%.$$

Since the stock is growing at a constant rate, g = Capital gains yield.

96. **Capital gains yield and dividend yield** **Answer: e** **Diff: M**

The capital gains yield is equal to the long-run growth rate for this stock (since it is a constant growth rate stock) or 7%. To calculate the dividend yield, first determine D_1 as $\$3.42 \times 1.07 = \$3.6594$. The dividend yield is \$3.6594/\$32.35 = 11.31%.

97. **Expected return and P/E ratio**   **Answer: b Diff: M**

Data given: EPS = $2.00; P/E = 40×; P_0 = $80; D_1 = $1.00; k_s = 10%; EPS_1 = $2.40.

Step 1: Calculate the price of the stock one year from today:

$k_s = D_1/P_0 + (P_1 - P_0)/P_0$

$0.10 = \$1/\$80 + (P_1 - \$80)/\$80$

$8 = \$1 + P_1 - \$80$

$\$87 = P_1.$

Step 2: Calculate the P/E ratio one year from today:

P/E = $87/$2.40 = 36.25×.

98. **Stock price and P/E ratio**   **Answer: a Diff: M**

Step 1: Calculate the required rate of return:

k_s = 8% + 2.0(12% - 8%) = 16%.

Step 2: Calculate the current market price:

$$P_0 = \frac{\$1.50(1.10)}{0.16 - 0.10} = \$27.50.$$

Step 3: Calculate the earnings and P/E ratio:

$D_1 = \$1.50(1.10) = \$1.65 = 0.30E_1.$

$E_1 = \$1.65/0.30 = \$5.50.$

$$\frac{P_0}{E_1} = \frac{\$27.50}{\$5.50} = 5.0\times.$$

99. Stock price   **Answer: d Diff: M**

Step 1: Set up an income statement to find net income:

Sales	$100,000	$10 × 10,000
Variable costs	50,000	$5 × 10,000
Fixed costs	10,000	(Given)
EBIT	$ 40,000	
Interest	1,200	0.08 × $15,000
EBT	$ 38,800	
Taxes	15,520	0.40 × $38,800
NI	$ 23,280	

Then, calculate the total amount of dividends, Div = Net income × Payout = $23,280 × 0.6 = $13,968.

Dividends/Share = Total dividend/# of shares outstanding
= $13,968/10,000 = $1.3968.

Note: Because these projections are for the coming year, this dividend is D_1, or the dividend for the coming year.

Step 2: Use the CAPM equation to find the required return on the stock:
$k_S = k_{RF} + (k_M - k_{RF})b = 0.05 + (0.09 - 0.05)1.4 = 0.106 = 10.6\%$.

Step 3: Calculate stock price:
$P_0 = D_1/(k_S - g)$
$= \$1.3968/(0.106 - 0.08)$
$= \$53.72$.

100. Beta coefficient   **Answer: c Diff: M**

Calculate old required return and beta:
$k_{s(old)} = \dfrac{\$2}{\$40} + 0.05 = 0.10$.
$0.10 = k_{RF} + (RP_M)b_{Old} = 0.06 + (0.02)b_{Old}$; $b_{Old} = 2.00$.

Calculate new required return and beta:
Note that $D_0 = \dfrac{\$2.00}{1.05} = \$1.90476$.
$D_{1,New} = \$1.90476(1.105) = \$2.10476$.
$k_{s(New)} = \dfrac{2.10476}{\$30} + 0.105 = 0.1752$.
$0.1752 = 0.08 + (0.03)b_{New}$; $b_{New} = 3.172 \approx 3.17$.

101. Risk and stock value   **Answer: d Diff: M**

Calculate required return on market and stock:
$k_M = 0.05(7\%) + 0.30(8\%) + 0.30(9\%) + 0.30(10\%) + 0.05(12\%) = 9.05\%$.
$k_s = 6.05\% + (9.05\% - 6.05\%)2.0 = 12.05\%$.

Calculate expected equilibrium stock price:
$$\hat{P}_0 = \frac{\$2(1.07)}{0.1205 - 0.07} = \$42.38.$$

102. Future stock price--constant growth   **Answer: b Diff: M**

First, find $k_s = 6\% + 5\%(0.8) = 10\%$. Then, find $P_0 = D_1/(k_s - g)$. $P_0 = \$3.00/(0.10 - 0.05) = \$60$. Finally, compound this at the 5% growth rate for 5 years to find $\hat{P}_5$. $\hat{P}_5 = \$60(1.05)^5 = \$76.58$.

103. Future stock price--constant growth   **Answer: e Diff: M**

The growth rate is the required return minus the dividend yield.
$g = 0.13 - 0.05 = 0.08$.

What is D_1?
$0.05 = D_1/\$28$
$\quad D_1 = \$1.40$.

What will be the Year 8 dividend?
$D_8 = D_1 \times (1 + g)^7 = \$1.40 \times (1.08)^7 = \$2.399354$.

The Year 7 price is given by:
$\hat{P}_7 = D_8/(k_s - g) = \$2.399354/0.05 = \$47.99$.

104. Future stock price--constant growth   **Answer: b Diff: M**

First, find $D_6 = \$2.00(1.07)^5 = \$2.8051$. Then, calculate $k_s = 0.06 + 0.05(1.2) = 0.12$.
It follows that: $P_5 = \$2.8051/(0.12 - 0.07) = \$56.10$.

105. Future stock price--constant growth   **Answer: b Diff: M**

To find the growth rate:
$k_s = D_1/P_0 + g$
Therefore $k_s - D_1/P_0 = g$
$\quad 0.12 - \$2/\$20 = 0.02$.

To find $\hat{P}_5$ we can use the following formula:
$\hat{P}_5 = D_6/k_s - g)$.
We therefore need D_6.
$D_6 = D_1(1 + g)^5$
$\quad = \$2(1.02)^5 = \$2.208$.
Therefore $\hat{P}_5 = D_6/k_s - g) = \$2.208/0.12 - 0.02) = \$22.08$.

106.   Future stock price--constant growth   **Answer: b   Diff: M**

Step 1:   Find the cost of equity:
$k_s = 6\% + (12\% - 6\%)1.4 = 14.4\%$.

Step 2:   Find the value of the stock at the end of Year 1:
$\hat{P}_1 = D_2/(k_s - g) = \$1.00/(0.144 - 0.05) = \$10.6383$.

Step 3:   Find the value of the stock in Year 4:
$\hat{P}_4 = \hat{P}_1(1.05)^3 = \$10.6383(1.05)^3 = \$12.3152 \approx \$12.32$.

107.   Future stock price--constant growth   **Answer: b   Diff: M**

Step 1:   Determine the stock's capital gains yield, g:
$k_s = D_1/P_0 + g$
$14\% = 5\% + g$
$9\% = g$.
This is the stock's growth rate.

Step 2:   Calculate the stock's price today:
$P_0 = D_1/(k_s - g)$
$= \$2.00/(0.14 - 0.09)$
$= \$40$.

Step 3:   Calculate the stock's price 5 years from today:
$\hat{P}_5 = \$40 \times (1.09)^5 = \$61.545 \approx \$61.54$.

If the stock price today is \$40 and the capital gains yield is 9 percent, the stock price must grow by 9 percent per year for the next five years, because this stock is a constant growth stock.

108.   Future stock price--constant growth   **Answer: e   Diff: M   N**

Step 1:   Calculate the firm's cost of equity:
$k_s = k_{RF} + (RP_M)b$
$= 4\% + (5\%)1.2$
$= 10\%$.

Step 2:   Calculate the firm's stock price today:
$$P_0 = \frac{D_1}{k_s - g}$$
$$= \frac{\$2.50}{0.10 - 0.06}$$
$$= \$62.50.$$

Step 3:   Find the expected stock price eight years from today:
$\hat{P}_N = \$62.50 \times (1 + g)^N$
$\hat{P}_8 = \$62.50 \times (1.06)^8$
$= \$99.6155 \approx \$99.62$.

109. FCF model for valuing stock **Answer: a Diff: M**

Step 1: Calculate the free cash flow amount:

$$FCF_1 = EBIT(1 - T) + Depreciation - \begin{matrix} Capital \\ Expenditures \end{matrix} \pm \Delta \begin{pmatrix} Net \\ operating \\ working \\ capital \end{pmatrix}$$

$= \$400 \text{ million} + \$80 \text{ million} - \$160 \text{ million} - \$0$

$= \$320 \text{ million}.$

Step 2: Calculate the firm value today using the constant growth corporate value model:

$$\text{Firm value} = \frac{FCF_1}{WACC - g}$$

$$= \frac{\$320}{0.10 - 0.05}$$

$$= \frac{\$320}{0.05}$$

$$= \$6,400 \text{ million}.$$

This is the total firm value today.

Step 3: Determine the market value of the equity and price per share:

$$MV_{Total} = MV_{Equity} + MV_{Debt}$$
$$\$6,400 \text{ million} = MV_{Equity} + \$1,400 \text{ million}$$
$$MV_{Equity} = \$5,000 \text{ million}.$$

This is today's market value of the firm's equity. Divide by the number of shares to find the current price per share.

$\$5,000 \text{ million}/125 \text{ million} = \$40.00.$

110. FCF model for valuing stock   **Answer: b Diff: M N**

First, we must find the expected free cash flow to be generated next year. (Remember, there was no change in net operating working capital.)

FCF_1 = EBIT(1 - T) + Depreciation – Gross capital expenditures
FCF_1 = $800(1 - 0.4) + $75 – $255
FCF_1 = $300 million.

Now, we can find the value of the entire firm since there is a constant growth assumption.

Value of firm = FCF_1/(WACC – g)
Value of firm = $300/(0.09 - 0.06)
Value of firm = $10,000 million.

Next, we must find the value of the firm's equity.

Value of equity = Value of firm – Value of debt and preferred stock
Value of equity = $10,000 – ($900 + $500)
Value of equity = $8,600 million.

To find the value per share of stock, we must divide the total value of the firm's equity by the number of shares outstanding.

Value per share = Value of equity/# of shares
Value per share = $8,600/200
Value per share = $43.00.

111. FCF model for valuing stock   **Answer: b Diff: M N**

Time Line:

	0		1	2	3	
		10%				
FCFs			3,000	4,000	5,000	$\frac{5,000(1 + 0.06)}{0.10 - 0.06}$
Continuing Value					132,500 =	
Total FCFs	0		3,000	4,000	137,500	

Enter the following data as inputs in the financial calculator:
CF_0 = 0; CF_1 = 3000; CF_2 = 4000; CF_3 = 137500; I = 10; and then solve for NPV = Total value of firm = $109,338.84.

So, the entire company is worth $109,338.84. This, less the market value of debt and preferred stock, which was given in the problem, leaves $109,338.84 - $25,000 = $84,338.84 as the value of the firm's common equity. The value of its common stock is calculated as $84,338.84/1,000 shares = $84.34/share.

112. FCF model for valuing stock   **Answer: e   Diff: M   N**

Step 1: Calculate the firm's free cash flows (in millions of dollars) for the next year:
FCF_1 = EBIT(1 − T) + Dep − Cap Exp. ± ΔNOWC
        = $300(1 − 0.4) + $50 − $100 − $60
        = $70 million.

Step 2: Calculate total firm value (TFV) today:
TFV = FCF_1/(WACC − g)
      = $70/(0.10 − 0.06)
      = $1,750 million.

Step 3: Calculate the firm's equity value today by subtracting today's market value of the firm's debt and preferred stock:
MV_E = TFV − MV_{D+P}
      = $1,750 − $500
      = $1,250 million.

Step 4: Calculate the firm's price per share today:
P_0 = MV_E/# shares
    = $1,250/20
    = $62.50.

113. New equity and equilibrium price   **Answer: c   Diff: M**

Calculate new equilibrium price and determine change:
$$P_{0,\ Old} = \frac{D_0(1.06)}{0.126 - 0.06} = \frac{\$1.00(1.06)}{0.066} = \$16.06.$$
$$P_{0,\ New} = \frac{\$1.00(1 + g_{New})}{\hat{k}_{s,\ New} - g_{New}} = \frac{\$1.00(1.065)}{0.135 - 0.065} = \frac{\$1.065}{0.07} = \$15.21.$$
Change in price = $15.21 − $16.06 = −$0.85.

114. Risk and stock price   **Answer: a   Diff: T**

Calculate the required rate of return:
D_0 = E_0(Payout ratio) = $4.00(0.40) = $1.60.
$$\hat{k}_s = \frac{D_0(1 + g)}{P_0} + g = \frac{\$1.60(1.06)}{\$30} + 0.06 = 11.65\%.$$
Calculate beta:
11.65% = 8% + (5%)b; b = 0.73.

Calculate the new beta:
b_{New} = 0.73(1.5) = 1.095.

Calculate the new required rate of return:
k_s = 8% + (5%)1.095 = 13.475% ≈ 13.48%.

Calculate the new expected equilibrium stock price:
$$\hat{P}_0 = \frac{\$1.696}{0.1348 - 0.06} = \$22.67.$$
Change in stock price = $22.67 − $30.00 = −$7.33.

115. Constant growth stock   **Answer: c   Diff: T**

Calculate the initial required return and equilibrium price:

$k_s = 0.07 + (0.08)1.5 = 0.19 = 19\%$.

$$P_0 = \frac{D_0(1 + g)}{k_s - g} = \frac{\$2(1.05)}{0.19 - 0.05} = \$15.00.$$

Calculate the new required return and equilibrium growth rate:

New $k_s = 0.07 + (0.08)1.75 = 0.21$.

$$0.21 = \frac{\$2(1 + g)}{\$15} + g; \; P_0 = \$15 \text{ (Unchanged)}.$$

$\$3.15 - \$2.0 = \$2g + \$15g$

$\quad\quad \$1.15 = \$17g$

$\quad\quad\quad\quad g = 0.06765 \approx 6.77\%$.

116. Supernormal growth stock   **Answer: c   Diff: T**

Time line:

```
   0    k_s = 10%  1           2           3           4   Years
        g_s = 20%      g_s = 20%   g_s = 20%   g_n = 8%
   |--------------|-----------|-----------|-----------|
```

$E_0 = 2.00 \quad\quad E_1 = 2.40 \quad\quad E_2 = 2.88 \quad\quad E_3 = 3.456 \quad E_4 = 3.73248$

$P_0 = ? \quad\quad\quad D_1 = 0.48 \quad\quad D_2 = 0.576 \quad\quad D_3 = 0.6912 \quad D_4 = 1.86624$

$$\hat{P}_3 = \frac{1.86624}{0.10 - 0.08} = \underline{93.31}$$

$CF_t \quad \underline{0} \quad\quad\quad\quad \underline{0.48} \quad\quad\quad \underline{0.576} \quad\quad \underline{94.003}$

Numerical solution:

$$P_0 = \frac{\$0.48}{1.10} + \frac{\$0.576}{(1.10)^2} + \frac{\$94.003}{(1.10)^3} = \$71.54.$$

Financial calculator solution:

Inputs: $CF_0 = 0$; $CF_1 = 0.48$; $CF_2 = 0.576$; $CF_3 = 94.003$; $I = 10$.

Output: NPV = \$71.54. P_0 = \$71.54.

117. Nonconstant growth stock   **Answer: b Diff: T**

Time line:

0	$k_s = 12\%$	1		2		3		4		5	Years
	$g_1 = 0\%$		$g_1 = 0\%$		$g_2 = 5\%$		$g_2 = 5\%$		$g_n = 10\%$		
0.50		0.50		0.50		0.525		0.55125		0.606375	

$$\hat{P}_2 = ?$$

$$\hat{P}_4 = \frac{0.606375}{0.12 - 0.10} = \underline{30.319}$$

$$CF_t \qquad\qquad\qquad\qquad \underline{0} \qquad\qquad \underline{0.525} \qquad\qquad \underline{30.87025}$$

Numerical solution:

$$\hat{P}_2 = \frac{\$0.525}{1.12} + \frac{\$30.87025}{(1.12)^2} = \$25.08.$$

Financial calculator solution:
Calculate the PV of the stock's expected cash flows as of time = 2.
Inputs: $CF_0 = 0$; $CF_1 = 0.525$; $CF_2 = 30.87025$; $I = 12$.
Output: NPV = \$25.08. $\hat{P}_2 = \$25.08$.

118. Nonconstant growth stock   **Answer: e Diff: T**

Time line:

0	$k_s = 15\%$	1	$g_1 = 0\%$	2	$g_2 = 5\%$	3	$g_n = 10\%$	4	Years
$P_0 = 49.87$		$D_1 = ?$		$D_2 = D_1$		$D_3 = D_2(1.05)$		$D_4 = D_3(1.10)$	

$$\hat{P}_3 = \frac{D_4}{0.15 - 0.10}$$

$$P_0 = \$49.87.$$

$$\hat{P}_3 = \frac{(1.05)(1.10)D_1}{0.15 - 0.10}.$$

$$\$49.87 = \frac{D_1}{1.15} + \frac{D_1}{(1.15)^2} + \frac{(1.05)D_1}{(1.15)^3} + \frac{\frac{(1.05)(1.10)D_1}{0.15 - 0.10}}{(1.15)^3}$$

$$\$49.87 = 0.8696D_1 + 0.7561D_1 + 0.6904D_1 + 15.1886D_1 = 17.5047D_1$$

$$D_1 = \$2.85.$$

119. Nonconstant growth stock   **Answer: c   Diff: T**

Use the SML equation to solve for k_s:
$k_s = 0.0625 + (0.05)(1.75) = 0.15 = 15\%$.

Calculate dividend per share:
$D_0 = (EPS_0)(\text{Payout ratio}) = (\$2.50)(0.4) = \$1.00$.

Calculate the dividend and price stream (once the stock becomes a constant growth stock):
$D_0 = \$1.00$; $D_1 = \$1.00 \times 1.25 = \$1.25$; $D_2 = \$1.25 \times 1.20 = \$1.50$;
$D_3 = \$1.50 \times 1.15 = \$1.725$; $D_4 = \$1.725 \times 1.07 = \$1.84575$;
$\hat{P}_3 = \dfrac{\$1.725(1.07)}{0.15 - 0.07} = \$23.071875$.

Put all the cash flows on a time line:
Time line:

0		1		2		3		4	Years
$k_s = 15\%$									
	$g_s = 25\%$		$g_s = 20\%$		$g_s = 15\%$		$g_n = 7\%$		
1.00		1.2500		1.5000		1.7250		1.84575	

$P_0 = ?$

$$23.071875 = \frac{1.84575}{0.15 - 0.07}$$

CF_t	0	1.2500	1.5000	24.796875

Finally, use the cash flow register to calculate PV:
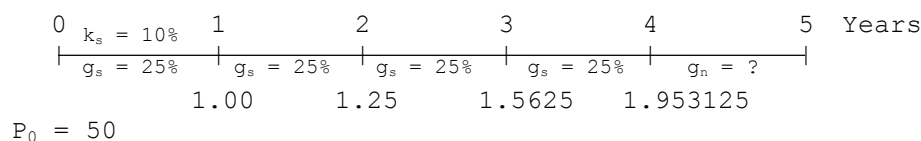$CF_0 = 0$; $CF_1 = 1.25$; $CF_2 = 1.50$; $CF_3 = 24.796875$; $I = 15\%$; and then solve for NPV = \$18.53.

120.   Stock growth rate   **Answer: b   Diff: T**

k_s = 10%; P_0 = $50; D_1 = $1.00; g_{4+} = ?

Step 1:   Draw the time line:

```
    0  k_s = 10%   1          2          3          4          5  Years
    ├────────────┼──────────┼──────────┼──────────┼──────────┤
    │  g_s = 25% │ g_s = 25%│ g_s = 25%│ g_s = 25%│  g_n = ? │
                  1.00       1.25      1.5625     1.953125
    P_0 = 50
```

Step 2:   Calculate the dividends:
g_{2-4} = 25%.
D_1 = $1.00.
D_2 = $1 × (1.25) = $1.25.
D_3 = $1.25 × (1.25) = $1.5625.
D_4 = $1.5625 × (1.25) = $1.953125.

Step 3:   Calculate the present value of these dividends:
PV_{div} = $1.00/1.10 + $1.25/(1.10)^2 + $1.5625/(1.10)^3 +
$1.953125/(1.10)^4
PV_{div} = $0.9091 + $1.0331 + $1.1739 + $1.3340
PV_{div} = $4.4501 ≈ $4.45.

Step 4:   Determine the stock's price at t = 4:
The PV of the stock at t = 4 must be the future value of the difference between today's price and the PV of the dividends through t = 4.
PV $\hat{P}_4$ = $50.00 - $4.45
     = $45.55.

FV = $45.55(1.10)^4 = $66.6898.
This is the price at t = 4.

Step 5:   Determine the constant growth rate:
$$\hat{P}_4 = D_5/(k_s - g)$$
$$\hat{P}_4 = [D_4(1 + g)]/(k_s - g)$$
$$\$66.6898 = [\$1.953125(1 + g)]/(0.10 - g)$$
$6.66898 − $66.6898g = $1.953125 + $1.953125g
$6.66898 − $1.953125 = $68.64288g
   $4.7158/$68.64288 = g
              6.87% = g.

121. Preferred stock value   **Answer: d Diff: T**

Time line:

```
     0  EAR = 6.183%  1          2          3          4          5  Years
     ├─────────────────┼──────────┼──────────┼──────────┼──────────┤
PV = ?                                                         FV = 5,000
```

Numerical solution:

$$P_p = \frac{\$6}{0.12} = \$50.$$

Amount needed to buy 100 shares:
$50(100) = $5,000.

$\$5,000 = PV(1 + 0.06/365)^{5(365)}$

$\$5,000 = PV(1.3498)$

$PV = \$3,704.18.$

Financial calculator solution:
Convert the nominal interest rate to an EAR:
Inputs: P/YR = 365; NOM% = 6. Output: EFF% = EAR = 6.18313%.

Calculate PV of deposit required today:
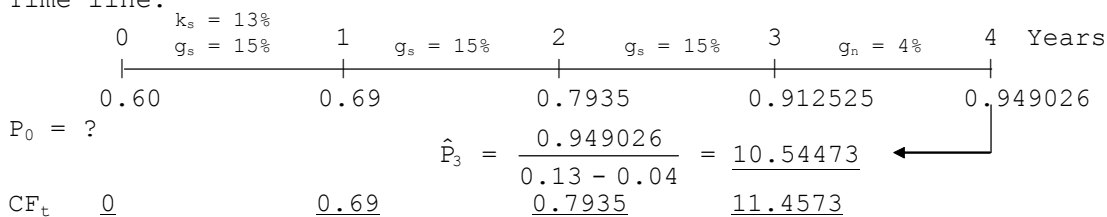Inputs: N = 5; I = 6.18313; PMT = 0; FV = 5000.
Output: PV = -$3,704.182 ≈ -$3,704.18. Deposit $3,704.18.

Note: If the financial calculator derived EAR is expressed to five decimal places it yields a PV = -$3,704.18.

122. Firm value   **Answer: c Diff: T**

Time line:

```
        0   k_s = 13%   1           2           3           4  Years
            g_s = 15%       g_s = 15%   g_s = 15%   g_n = 4%
        ├───────────────┼───────────┼───────────┼───────────┤
        0.60           0.69        0.7935      0.912525    0.949026
P_0 = ?
                                  P̂_3 = 0.949026 / (0.13 - 0.04) = 10.54473
CF_t    0              0.69        0.7935      11.4573
```

Calculate required rate of return:
k_s = 8% + (4%)1.25 = 13.0%.

Calculate net income, total dividends, and D_0:
Net income = $1.4 million/(1 - payout ratio)
            = $1.4 million/0.7 = $2.0 million.
 Dividends = $2.0 million × 0.3 = $0.6 million.
       D_0 = $600,000/1,000,000 shares = $0.60.

Financial calculator solution:
Inputs: CF_0 = 0; CF_1 = 0.69; CF_2 = 0.7935; CF_3 = 11.4573; I = 13.
Output: NPV = $9.17. P_0 = $9.17.

Total market value = P_0 × Shares outstanding = $9.17 × 1,000,000 = $9,170,000.

123. Stock price--nonconstant growth   Answer: b Diff: M N

First, we must find the explicit forecasted dividends:
$D_1 = 0.75$
$D_2 = 0.9375$ $(0.75 \times 1.25 = 0.9375)$
$D_3 = 1.265625$ $(0.9375 \times 1.35 = 1.265625)$
$D_4 = 1.3415625$ $(1.265625 \times 1.06 = 1.3415625)$

Now, we need to determine the terminal value of the stock in Year 3, using the Year 4 dividend:

$\hat{P}_3 = D_4/(k_s - g)$
$\hat{P}_3 = \$1.3415625/(0.10 - 0.06)$
$\hat{P}_3 = \$33.5390625.$

$P_0 = \dfrac{\$0.75}{1.10} + \dfrac{\$0.9375}{(1.10)^2} + \dfrac{(\$1.265625 + \$33.5390625}{(1.10)^3}$

  $= \$0.6818 + \$0.7748 + \$26.1493$
  $= \$27.6059 \approx \$27.61.$

Alternatively, enter all of the dividend cash flows along with the terminal value of the stock into the cash flow register and enter the 10% cost of equity to solve for the price of the stock today:
$CF_0 = 0$; $CF_1 = 0.75$; $CF_2 = 0.9375$; $CF_3 = 1.265625 + 33.5390625 = 34.8046875$;
I/YR = 10; and then solve for NPV = \$27.61.

124. Future stock price--constant growth   Answer: c Diff: M N

In 10 years, this stock will be a constant growth stock. Therefore, use the constant growth formula and find the price in Year 10. In order to find the value in Year 10, determine the dividend in Year 11:
$D_{11} = 0.75 \times 1.25 \times 1.35 \times (1.06)^8 = \$2.0172.$

Now, calculate the stock price in Year 10:
$\hat{P}_{10} = D_{11}/(k_s - g)$
$\hat{P}_{10} = \$2.0172/(0.10 - 0.06)$
$\hat{P}_{10} = \$50.43.$

Alternatively, you could have taken the terminal value $\hat{P}_3$ calculated in the previous question and used the constant growth rate to find $\hat{P}_{10}$:
$\hat{P}_{10} = \hat{P}_3 \times (1 + g)^7$
$\hat{P}_{10} = \$33.5391 \times (1.06)^7$
$\hat{P}_{10} = \$50.43.$

125. Free cash flow   Answer: b Diff: E N

FCF_1 = EBIT(1 - T) + Depreciation - ΔNOWC - Capital expenditures
    = \$500,000,000 - \$300,000,000 = \$200,000,000.

126. FCF model for valuing stock   **Answer: b Diff: M N**

Using the FCF model, $\hat{P}_3 = F\hat{C}F_3(1.07)/(0.11 - 0.07) = [(\$750 - \$500)(1.07)]/0.04 = \$6,687.50$, which is the value of the firm at $t = 3$ after the dividend is received.

So, the value of the firm today $= \$200/(1.11) + \$200/(1.11)^2 + (\$250 + \$6,687.50)/(1.11)^3 = \$5,415.1449$ million $\approx \$5,415$ million.

This is the value of the total firm (debt, preferred stock, and equity), so the value of debt and preferred stock must be deducted to arrive at the value of the firm's common equity. The common equity has a value of \$5,415 million – \$700 million = \$4,715 million. So, the price/share = \$4,715 million/100 million = \$47.15.

127. Nonconstant growth stock   **Answer: b Diff: M N**

$\hat{P}_4 = D_4(1 + g)/(k_s - g) = \$1.75(1.06)/(0.13 - 0.06) = \$26.50.$

$\hat{P}_0 = \$1.75/1.13 + \$1.75/(1.13)^2 + \$1.75/(1.13)^3 + (\$1.75 + \$26.50)/(1.13)^4$

$\hat{P}_0 = \$1.5487 + \$1.3705 + \$1.2128 + \$17.3263$

$\hat{P}_0 = \$21.4583 \approx \$21.46.$

128. Future stock price--nonconstant growth   **Answer: b Diff: M N**

$\hat{P}_1 = \$1.75/1.13 + \$1.75/(1.13)^2 + (\$1.75 + \$26.50)/(1.13)^3$

$\hat{P}_1 = \$1.5487 + \$1.3705 + \$19.5787$

$\hat{P}_1 = \$22.4979 \approx \$22.50.$