Sample Problems – Chapter 9

Title: Preferred stock (solve for value)
1. Timeless Corporation issued preferred stock with a par value of $700. The stock promised to pay an annual dividend equal to 19.0% of the par value. If the appropriate discount rate for this stock is 10.0%, what is the value of the stock?
a. $1,330.00
b. $368.42
c. $772.28
d. $1,532.16
e. $1,506.89

Title: Preferred stock (solve for req. return)
2. Forever, Inc.'s preferred stock has a par value of $1,000 and a dividend equal to 13.0% of the par value. The stock is currently selling for $907.00. What discount rate is being used to value the stock?
a. 15.08%
b. 14.33%
c. 15.75%
d. 13.34%
e. 12.10%

Title: Preferred stock (solve for dividend)
3. Here and After Corporation plans a new issue of preferred stock. Similar risk stock currently offers an annual return to investors of 17.0%. The company wants the stock to sell for $569.00 per share. What annual dividend must the company offer?
a. $139.48
b. $3,347.06
c. $107.37
d. $96.73
e. $3,089.34

Title: Constant Growth Model (old div)
4. You are considering buying common stock in Grow On, Inc. The firm yesterday paid a dividend of $5.20. You have projected that dividends will grow at a rate of 8.0% per year indefinitely. If you want an annual return of 20.0%, what is the most you should pay for the stock now?
a. $28.08
b. $43.33
c. $26.00
d. $46.80
e. $51.13

Title: Constant Growth Model (new div)
5. You are considering buying common stock in Grow On, Inc. You have projected that the next dividend the company will pay will equal $4.00 and that dividends will grow at a rate of 5.0% per year thereafter. If you would want an annual return of 13.0% to invest in this stock, what is the most you should pay for the stock now?
a. $30.77
b. $52.50
c. $50.00
d. $32.31
e. $54.63

Title: Supernormal growth (two years g(s))
6. Growing, Inc. is a firm that is experiencing rapid growth. The firm yesterday paid a dividend of $7.50. You believe that dividends will grow at a rate of 24.0% per year for two years, and then at a rate of 5.0% per year thereafter. You expect the stock will sell for $46.57 in two years. You expect an annual rate of return of 18.0% on this investment. If you plan to hold the stock indefinitely, what is the most you would pay for the stock now?
a. $89.91
b. $72.85
c. $49.61
d. $61.52
e. $83.06

Title: Supernormal growth (three years g(s))
7. Growing, Inc. is a firm that is experiencing rapid growth. The firm yesterday paid a dividend of $5.60. You believe that dividends will grow at a rate of 24.0% per year for three years, and then at a rate of 10.0% per year thereafter. You expect that the stock will sell for $177.59 in three years. You expect an annual rate of return of 18.0% on this investment. If you plan to hold the stock indefinitely, what is the most you would pay for the stock now?
a. $107.92
b. $94.29
c. $126.66
d. $79.63
e. $116.83

Title: Supernormal growth (three growth rates - four years)
8. Growing, Inc. is a firm that is experiencing rapid growth. The firm yesterday paid a dividend of $8.00. You believe that dividends will grow at a rate of 22.0% per year for years one and two, 15.0% per year for years three and four, and then at a rate of 9.0% per year thereafter. If you expect an annual rate of return of 21.0% on this investment, what is the most you would pay for the stock now?
a. $130.52
b. $106.07
c. $113.03
d. $98.00
e. $89.41

Title: Constant Growth Model (old div - CAPM)
9. You are considering buying common stock in Grow On, Inc. The firm yesterday paid a dividend of $4.70. You have projected that dividends will grow at a rate of 6.0% per year indefinitely. The firm's beta is 2.39, the risk-free rate is 4.0%, and the market return is 10.9%. What is the most you should pay for the stock now?
a. $22.94
b. $32.44
c. $34.38
d. $24.31
e. $37.56

Title: Constant Growth Model (new div - CAPM)
10. You are considering buying common stock in Grow On, Inc. You have projected that the next dividend the company will pay will equal $7.60 and that dividends will grow at a rate of 6.0% per year thereafter. The firm's beta is 0.93, the risk-free rate is 6.1%, and the market return is 13.6%. What is the most you should pay for the stock now?
a. $107.34
b. $113.79
c. $58.10
d. $61.59
e. $117.28

Title: Free cash flow (constant growth)
11. You are considering buying common stock in Grow On, Inc. You have calculated that the firm's free cash flow was $8.10 million last year. You project that free cash flow will grow at a rate of 6.0% per year indefinitely. The firm currently has outstanding debt and preferred stock with a total market value of $9.22 million. The firm has 1.20 million shares of common stock outstanding. If the firm's cost of capital is 25.0%, what is the most you should pay per share for the stock now?
a. $35.97
b. $37.66
c. $45.19
d. $29.98
e. $49.37

Title: FCF(supernormal growth)
12. You are considering buying common stock in Super Growth, Inc. You have calculated that the firm's free cash flow was $6.20 million last year. You project that free cash flow will grow at a rate of 20.0% per year for the next three years, and then 6.0% per year indefinitely thereafter. The firm currently has outstanding debt and preferred stock with a total market value of $26.60 million. The firm has 1.68 million shares of common stock outstanding. If the firm's cost of capital is 19.0%, what is the most you should pay per share for the stock now?
a. $76.59
b. $42.12
c. $15.83
d. $70.75
e. $26.28

1.

N	I	***PV***	FV	PMT
1000	**10**	**1330**		**(700)(0.19)**

2.

N	***I***	PV	FV	PMT
1000	**14.33**	**-907**		**(1000)(0.13)**

3.

N	I	PV	FV	***PMT***
1000	**17**	**-569**		**96.73**

4.

$$P_0 = \frac{D_0(1+g)}{k_s - g} = \frac{5.20(1+0.08)}{0.20 - 0.08} = 46.80$$

5.

$$P_0 = \frac{D_1}{k_s - g} = \frac{4.00}{0.13 - 0.05} = 50.00$$

6.
$D_1 = 7.50(1+0.24) = 9.30$
$D_2 = 9.30(1+0.24) = 11.532$
$P_2 = [11.532(1+0.05)]/(0.18-0.05) = 93.14$

CF0 = 0
CF1 = 9.30
CF2 = 11.532 + 93.14
I = 18
NPV = 83.06

TI83: npv(18,0,{9.30,104.672})

7.
$D_1 = 5.60(1+0.24) = 6.944$
$D_2 = 6.944(1+0.24) = 8.611$
$D_3 = 8.611(1+0.24) = 10.677$
$P_3 = [10.677(1+0.10)]/(0.18-0.10) = 146.81$

CF0 = 0
CF1 = 6.944
CF2 = 8.611
CF3 = 10.677 + 146.81
I = 18
NPV = 107.92

TI83: npv(18,0,{6.944,8.611,157.487})

8.
$D_1 = 8.00(1+0.22) = 9.76$
$D_2 = 9.76(1+0.22) = 11.907$
$D_3 = 11.907(1+0.15) = 13.6933$
$D_4 = 13.6933(1+0.15) = 15.7473$
$P_4 = [15.7473(1+0.09)]/(0.21-0.09) = 143.04$

CF0 = 0
CF1 = 9.76
CF2 = 11.907
CF3 = 13.6933
CF4 = 15.7473 + 143.04 = 158.785
I = 21
NPV = 98.00

TI83: npv(21,0,{9.76,11.907,13.6933,158.785})

9.
$k_i = k_{RF} + b_i(k_M - k_{RF})$
$k_i = 4.0\% + 2.39(10.9\% - 4.0\%) = 20.491\%$

$$P_0 = \frac{D_0(1+g)}{k_s - g} = \frac{4.70(1+0.06)}{0.20491 - 0.06} = 34.38$$

10.
$k_i = k_{RF} + b_i(k_M - k_{RF})$
$k_i = 6.1\% + 0.93(13.6\% - 6.1\%) = 13.08\%$

$$P_0 = \frac{D_1}{k_s - g} = \frac{7.60}{0.1308 - 0.06} = 107.34$$

11.
Let V_0 represent the total value of the firm based on the free cash flow model.

$$V_0 = \frac{FCF_0(1+g)}{k_s - g} = \frac{8.10(1+0.06)}{0.25 - 0.06} = 45.19$$

Value of firm = value of debt and preferred + value of equity
45.19 = 9.22 + value of equity
value of equity = 35.97

value per share = (total value)/(number of shares)
value per share = (35.97)/(1.2) = 29.98

12.
$FCF_1 = 6.2(1+0.20) = 7.44$
$FCF_2 = 7.44(1+0.20) = 8.928$
$FCF_3 = 8.928(1+0.20) = 10.7136$
$P_3 = [10.7136(1+0.06)]/(0.19-0.06) = 87.36$

CF0 = 0
CF1 = 7.44
CF2 = 8.928
CF3 = 10.7136+ 87.36
I = 19
NPV = 70.755

TI83: npv(19,0,{7.44,8.928,98.0736})

Value of firm = value of debt and preferred + value of equity
70.755 = 26.60 + value of equity
value of equity = 44.155

value per share = (total value)/(number of shares)
value per share = (44.155)/(1.68) = 26.28