

MATH 373
Quiz 5
Spring 2018
April 5, 2018

1. The preferred stock of Patterson Industries pays a quarterly dividend of 2.45 with the next dividend being paid in 2 months.

Using the dividend discount method, determine the price of this preferred stock to yield 8% compounded quarterly.

Solution:

Dividends are quarterly so we need $\frac{i^{(4)}}{4}$. We are given $i^{(4)} = 0.08$ so $\frac{i^{(4)}}{4} = \frac{0.08}{4} = 0.02$.

$$\text{Price} = PV = 2.45 \frac{1}{0.02} (1.02)^{1/3} = 123.31$$

We multiply by $(1.02)^{1/3}$ because the first dividend is payable in two months.

2. The common stock of Hibbler LTD pays a quarterly dividend with the next dividend of 4.00 to be paid in three months. Hibbler is a rapidly growing company and dividends are expected to increase each quarter. The amount of the increase is expected to be 2% per quarter. In other words, the first dividend will be 4.00. The second dividend will be $4.00(1.02)$. The third dividend will be $4.00(1.02)^2$. The dividends will continue to increase in this pattern.

Using the dividend discount method, determine the price of this common stock to yield a 12% annual effective rate.

Solution:

Dividends are quarterly so we need $\frac{i^{(4)}}{4}$. We are given $i = 0.12$

$$\text{so } \frac{i^{(4)}}{4} = (1.12)^{1/4} - 1 = 0.028737345.$$

$$\text{Price} = PV = 4(1.028737345)^{-1} + 4(1.02)(1.028737345)^{-2} + \dots$$

$$\frac{4(1.028737345)^{-1} - 0}{1 - (1.02)(1.028737345)^{-1}} = 457.80$$

3. The common stock of LaMaster Corporation pays a quarterly dividend with the next dividend of 30.00 being paid later today. Each dividend is expected to be 0.25 larger than the prior dividend. In other words, the first dividend will be 30.00, the second dividend will be 30.25, the third dividend will be 30.50, etc.

Using the dividend discount method, determine the price of this common stock to yield a 12% compounded quarterly.

Solution:

Dividends are quarterly so we need $\frac{i^{(4)}}{4}$. We are given $i^{(4)} = 0.12$ so $\frac{i^{(4)}}{4} = \frac{0.12}{4} = 0.03$.

We also note that this is a perpetuity due since the next dividend is paid later today.

$$\text{Price} = PV = \left[\frac{30}{0.03} + \frac{0.25}{(0.03)^2} \right] (1.03) = 1316.11$$

We multiply by (1.03) because the first dividend is payable today.