Midterm Answers

1. Here is the future value:
$$\$3,000(1.10^{15})+\$3,000(1.10^{14})+\ldots+\$3,000(1.10^{1})=\$104,849$$

2. (James Rufus Koren, "CalPERS Return Worst Since 2009," Los Angeles Times, July 19, 2016). This explanation is puzzling because bond prices can only go up if interest rates go down, but lower interest rates are good for stock prices. (Low-rated bonds are affected by default risk (and, hence, the economy), but it is unlikely that CalPERS owns many low-rated bonds.) So, "the same factors" must be wrong.

3. (Jeff Muskus, "Why use an ATM when you can pay more?," Bloomberg Businessweek, March 9-15, 2015, pp. 44-45.)
    a. They got 730 percent by multiplying 2 times 365.
    b. The effective annual return with daily compounding is $1+ R = 1.02^{365} = 1377.41$, so $R = 137,641\%$.

4. Answer (b) is correct. If $\rho = R$, then there would be no economic value added, and $P = K$. Only (b) and (c) have this property, and (c) ignores profits and the required return. The economic value added each period is the profits ρK minus the cost of capital, RK: EVA $= (\rho$ - R)K Using the present value of a perpetuity, the value of the firm is
$$P = K + \frac{(\rho - R)K}{R}$$

5. This is seldom a good idea. The mortgage interest is tax-deductible and the IRA returns are tax-deferred. The after-tax return on the IRA is likely to be substantially higher than the after-tax interest rate on the loan.

6. Theoretically, there is a positive relationship between the rate of inflation and interest rates, but this student incorrectly used the price level instead of the rate of inflation and got the wrong sign The correct regression, using the rate of inflation, gives the correct sign:
$$R = 2.48 + \quad 0.749I, \qquad R^2 = 0.016$$
$$[15.67] \quad [1.93]$$

7. Consider the constant-dividend-growth model's equation, $R = D/P + g$. For two stocks to have comparable returns when one has a higher anticipated dividend growth rate, the other must be priced to have a higher dividend yield. It is true that firms that pay high dividends have less money to retain for financing growth; but the dividend yield D/P reflects not just the level of dividends D, but the price P determined in the stock market. A firm with a high D need not have a high D/P. It will be priced to have a high D/P if its growth rate is meager, but a firm with a relatively high payout ratio could still, because of a high return on equity ROE, have a high growth rate and be priced to have a relatively low dividend yield.

8. The Fool looks at $\$3.52(1.11)^{10} = \$10$, but you do not have to wait 10 years to get the $10. Because getting $1 each year for 10 years is better than getting $10 at the end of 10 years, you would pay more than $3.52 (which is what the Fool concludes, too). At an 11% required return, the present value of $1 a year for 10 years is $5.89.

9. It would be surprising if the term structure did not take interest rate expectations into account. The upward sloping term structure suggests that investors expect interest rates to rise, in which case rolling over the 1-year zeros will be at higher interest rates and make up for the initially low return.

10. Mathematically, the duration is not infinite unless the growth rate is equal to the required return—in which case, the value of the stock is infinite. Or we could reason as follows: if the duration were infinite, a one percentage-point change in the required return would have an infinite effect on the value of the stock, which is clearly untrue.