Session 12a: Post class test solutions

1. **a. $261.12 million.** To compute the market value of the debt, discount the expected interest expenses and the principal on the debt at the pre-tax cost of debt
   - Market value of debt = 12.5*(1-1.04^{-5})/0.04+250/1.04^5 = $261.12 m
   - The first term is the present value of $12.5 million as an annuity for 5 years, discounted back at 4%. The second term is the present value of the face value of the debt at the end of year 5.

2. **c. $77.56 million.** The debt value of leases is the present value of the operating leases at the pre-tax cost of debt.
   - Debt value of leases = PV of annuity of $12 million @5% for 8 years = $77.56 million

3. **d. 6.6%.** The first step is to compute the market value weights of debt and equity
   - Debt to capital ratio = 80/(120+80) = 40%
   - Cost of capital = 9%(.6) + 4% (1-.4) (.4) = 6.36%

4. **c. 7.55%.** The first step is to decompose the convertible bond into its debt and equity components. To do this, value the convertible bond as if it were a straight bond by discounting the coupons and face value back at the pre-tax cost of debt:
   - Value of straight bond portion = $2 million (PV of annuity for 10 years @5%) + $100 million/1.05^{10} = $76.83 million
   - Value of conversion option = Market value of convertible – Straight bond value = $120 - $76.83 = $43.17 million
   - Overall value of equity = $143.17 million
   - Cost of capital = 10% (143.17/(143.17+76.83)) + 5% (1-.4) (76.83/(143.17+76.83)) = 7.55%

5. **a. 8.78%.** First, compute the preferred dividend yield, which is also the cost of preferred stock:
   - Preferred dividend yield = $6/80 = 7.5%
   - Cost of capital = 12%(200/400)+ 6%(1-.4)(100/400)+7.5%(100/400) = 8.78%