Session 15a: Post class test solutions

1. **d. $340,000.** To compute the NPV to equity investors, you have to begin by estimating the cash flows to equity:
    - Interest expense = 1,500,000*.04 = $60,000
    - Net Income = (200,000 – 60,000)(1-.4) = $84,000
    - After-tax cash flow to equity= $84,000 (since cap ex = depreciation)
    - Initial equity investment = $2,000,00 - $1,500,000 = $500,000
    - NPV = 84,000/.10 – 500000 = $340,000
2. **d or e. $340,000 or $790,698.** To compute the NPV on the entire investment, you have to compute the cost of capital. Here is the simpler version based upon the breakdown of the book value of the initial investment ($500 million in equity & 1500 million in debt):
    - Cost of capital = 10% (500/2000) + 4% (1-.4)(1500/2000) = 4.3%
    - After-tax cash flow to firm = 200000(1-.4) = $120,000
    - NPV = -2,000,000 + 120000/.043 = $790,698

    Here is a more sophisticated way to do this. Rather than use the book value of equity invested, use the value of equity that we estimated in the first problem ($840,000) to get the cost of capital:
    - Cost of capital = 10% (840/2340) + 4% (1-.4)(1500/2340) = 5.128%
    - NPV = -2,000,000 + 120000/.05128 = $340,000
3. **b. $222.22 million**. To value Beachtime, you have to use the discount rates of Beachtime (since those reflect Beachtime's risk). Since the cash flows are prior to debt payments, you should use the cost of capital (11%).
    - Value of Beachtime = 20 / (.11-.02) = $222.22 million
    - Note that the after-tax cash flow is already next year's estimate. There is no need to grow it out at (1+growth rate)
4. **d. There can be more than one IRR.** The cash flows change signs twice (from negative to positive in year 1 and from positive to negative in year 3).
   Yes. At a 10% cost of capital, the NPV is positive ($4.21 million)

5. b. Between 10% and 25%. The intermediate cash flows will now get invested at 10%, leading to a lower cumulative future cash flow. That will cause the modified IRR to be between 10% and 25%, depending on how large the intermediate cash flows are.