Group Activity

Name: _____ **Date:** _____

Directions: Using the formulas for Future Value and Present Value calculations or the Investopedia calculators, work in a group of 2-4 students to answer the following questions.

Future Value

$X \times (1 + r)^{\#periods} = \text{future value}$

Present Value

$$X = \frac{\text{future value}}{X \times (1 + r)^{\#periods}}$$

1. Alex's grandmother has $10,000 in a bank account that is not earning interest. Alex is 12 years old, and his grandmother has promised to give him this $10,000 to spend on college tuition – once he graduates from high school in six years. Alex understands the time value of money, so he wants to persuade his grandmother to put the money in an S&P index fund instead. Although no one can be sure what the rate of return will be, historically S&P funds have earned an average of 10% per year. Calculate the future value of the $10,000 (in six years) if the money was invested at a 10% annual return instead. Assume compounding is only once a year.

2. Sofia has a government bond that will be worth $500 when it matures in 5 years. She wants to sell it to her brother because she needs the cash now for car repairs. Assuming an interest rate of 3% and assuming monthly compounding, what is the present value of the bond?

3. Darius worked in a union motorcycle factory for 20 years before returning to school to become a paramedic instead. He is 45 now. He has a pension from his previous employer, which would pay him $1500/month after his retirement at 65. Assuming he will live to 80 (which is slightly higher than the life expectancy for an American man), he would earn $270,000 over 15 years. The company has stopped offering pensions and wants to buy out his pension today. Should Darius accept a buyout offer of $125,000? Assume that he could invest the money at an interest rate of 3% with monthly compounding.

4. Sam and Nadia just inherited $150,000 from Nadia's grandmother. This is exactly the amount of principal remaining on their mortgage. They are wondering: *Should they pay off the mortgage or keep making their monthly payments and invest the money in an S&P Index fund?* They have a 30-year mortgage at 4% interest, and they have 16 years remaining to pay. They pay $1000/month in principal and interest payments. Assume they could earn about 6% annual interest on an investment, which would compound monthly.