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Math 121

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Dear Friend,

Since our dinner together last night I have been genuinely concerned about the fate of your future retirement fund. In order for you to make an adequate decision, I have composed four example scenarios, one of which is the scenario that you brought to the table last night. In Scenario A, payments of $250 are compounded monthly at an interest rate of 7% over the course of 18 years. In those first 18 years alone, your $54,000 investment will have earned an additional $53,000 in interest. Then, if you were to let the $107,000 sit in an account for an additional 25 years, by the time that you were 65 years old your $54,000 investment will have skyrocketed to $616,514. Thus, if you were to adapt to this strategy, you would earn $562,514 in interest over the course of 43 years; which would ultimately allow you to make monthly withdrawals of $4,583 for 22 years. Now, if you were to adapt to the strategy you had spoken about last night, with payments of $500 compounded monthly at an interest rate of 7% over the course of 25 years, you would have $405,035 by the time you were 65. In that amount of time, you would have only earned $251,035 in interest instead of $562,514. Also, instead of being able to withdraw $4,583 a month for 22 years, you would only be able to withdraw $3,011 a month. While this scenario does not sound like a horrible deal, it is not the best option that you could pursue. Scenario B combines both Scenario A and C. This scenario would require you to open two separate accounts. In the first account, you would follow the steps of Scenario A and deposit $250 a month for 18 years, and then let that money sit for an additional 25 years. As we know, this would add up to $616,514 by the time you were 65 years old. In the second account, you would do what you had initially planned to do by depositing $500 a month for 25 years. With both accounts, you will have earned $1,021,550 in total. Considering your total investment would only be $204,000, you will have earned $817,550 in interest over the course of 43 years. This would allow you to make monthly withdrawals of $7,594 a month for 22 years. I hope that it is now clear to you know how crucial it is to begin investing for retirement early, regardless of how much you can invest at the time. However, if by chance you are not convinced, I have one last scenario to share with you. Scenario D would require you use two separate accounts. In the first account, you would invest $250 a month where interest is compounded monthly at 7% for 18 years. Then for another ten years, it would remain to collect interest. In the second account, you would deposit $500 a month into an account where the interest was the same, starting at age 40 until you turn 50 years old. When both accounts are added together, you will have earned $302,943. However, if you were to withdrawal $20,000 for a lavish vacation every five years until you turned 65, you would have $757,545 left. The total gross amount that you would have invested would be $114,000, which is less than the total amount invested in Scenario C. So, even if you were to invest less for a smaller amount of time, and spend $60,000 in vacations, you would still be left with more money than if you were to pursue Scenario C. By now, I can assure that you are eager to start saving. However, if you wish to wait until you are 40, I have calculated the monthly costs that would be required in order to achieve each of these scenarios. Scenario A would require $761 a month, B would need $1,261, and D would require $935 a month for 25 years. Although I have provided you with this information, I hope that you can grasp that the actual key to an insightful investment is time, not money. Therefore, I suggest that you use the chart below to weigh out your retirement options.

Best of luck,

Your Financially Competent Friend

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| --- | --- | --- | --- | --- |
|  | Scenario A | Scenario B | Scenario C | Scenario D |
| Ending Balance at age 65 | $616,514 | $1,021,550 | $405,035 | $757,545 |
| Total Amount Invested | $54,000 | $204,000 | $154,000 | Gross: $114,000  Net: $54,000 |
| Interest Earned | $562,514 | $817,550 | $251,035 | Gross: $643,545  Net: $703,545 |
| Monthly Retirement Income From 65-87 | $4,583 | $7,594 | $3,011 | $5,631 |
| Monthly Payment Required in Scenario C to match A,B, & D | $761 | $1,261 | N/A | $935 |