Time Value of Money Homework Exercise - KEY

Use the Time Value of Money tables to answer the following questions. Show your work!

1. You just purchased a house for $130,000. Similar houses in your area are going up in value at a rate of 5% per year.

    a. How much will your house be worth at the end of 15 years?

N = 15	**Table 1 – FV of a Lump Sum**
I = 5%	**Factor for 5%, 15 years = 2.0789**
PV = $130,000	
PMT = $0	**FV = $130,000 x 2.0789 = $270,257**
FV = ?? = $270,257	

    b. How much will it be worth at the end of 30 years?

N = 30	**Table 1 – FV of a Lump Sum**
I = 5%	**Factor for 5%, 30 years = 4.3219**
PV = $130,000	
PMT = $0	**FV = $130,000 x 4.3219 = $561,847**
FV = ?? = $561,847	

2. Your elderly neighbor just told you that he purchased his first new car for $1,500 about 50 years ago. That has you wondering how much a new car will cost you when you are older. Car prices today average $20,000. It appears that car prices increase at a rate of 6% every year. How much will a new car cost 50 years from today?

N = 50	**Table 1 – FV of a Lump Sum**
I = 6%	**Factor for 6%, 50 years = 18.4202**
PV = $20,000	
PMT = $0	**FV = $20,000 x 18.4202 = $368,404**
FV = ?? = $368,404 is the purchase price for a new car 50 years from now	

3. You just won a prize!! The company that sponsored the prize will pay you $4,000, but you won't get this $4,000 until 3 years from today. Rather than waiting 3 years to collect this money, you are thinking of selling your rights to this prize to someone else so that you will receive some cash today. You can earn a return of 8% on your money. What is the lowest amount of money that you would sell your rights to this prize?

N = 3	**Table 2 – PV of a Lump Sum**
I = 8%	**Factor for 8%, 3 years = 0.7938**
PV = ?? = $3,175.20 is the minimum price you would take	
PMT = $0	**PV = $4,000 x 0.7938= $3,175.20**
FV = $4,000	

4. What are the three main reasons that money has a time value?
Risk
Inflation   **RIO**
Opportunity Cost

5. Your church wants to build a new community education center, so they have set a goal of collecting $250,000 over the next 8 years to pay for the building. They can invest their money in account that earns 5% each year. They hope to collect contributions of $25,000/year over the next 8 years. Will the church be able to reach their goal? (Assume BGN payments)

N = 8	**Table 7 – FV of an Annuity**
I = 5%	**Factor for 5%, 8 years = 10.0266**
PV = $0	
PMT = $25,000	**FV = $25,000 x 10.0266 = $250,665**
FV = ?? = $250,665	

Yes, they will be able to meet their goal because the FV is greater than the $250,000 goal.

6. Your grandparents started investing for your college tuition as soon as you were born. They invested $2,000/year every year since you were born. Their college investment account earned a return of 7% each year. How much money will be in your college education account after 18 years of contributions? (Assume BGN payments)

N = 18	**Table 7 – FV of an Annuity**
I = 7%	**Factor for 7%, 18 years = 36.3790**
PV = $0	
PMT = $2,000	**FV = $2,000 x 36.3790 = $72,758**
FV = ?? = $72,758	

Your college education account will have $72,758 after 18 years of contributions by your grandparents. Thank you, grandparents!

7. Use the TVM Calculator spreadsheet to double-check your answers. List the answers to each question that you get from using the spreadsheet:
Question 1: **a. $270,260.66 b. $561,852.51**

Question 2: _____**$368,403.09**_____

Question 3: _____**$3,175.33**_____

Question 5: _____**$250,664.11**_____

Question 6: _____**$72,757.93**_____