



### WIR SOLUTIONS: Sections 6.1 and 6.2

This document contains the answers and video solutions to the posed problems. Click the red box to watch the video solution. You can also watch all videos by viewing the [Section 6.1 and 6.2 playlist](#). Closed captions are available for all videos and the speed of the videos may be adjusted inside of "Settings" or the cog in the bottom right corner.

#### Section 6.1

Below are videos that give a quick explanation of some of the concepts covered in Section 6.1:

- [Introduction to using the TVM Solver on the TI-84 Family of Calculators](#)

- (1) Suppose you have borrowed \$1000 from a bank that charges simple interest at an annual rate of 18%. How much will you pay in interest for the first month?.

*Answer:* \$15

[Click here for video solution to #1.](#)

- (2) An account with an initial amount of \$1000 earns simple interest of 9% annually. How much is in the account after four years?

*Answer:* 9% simple interest rate

[Click here for video solution to #2.](#)

- (3) A person deposits \$1000 into an account earning simple interest. What simple interest rate is being obtained if the amount in the account at the end of eight months is \$1060?

*Answer:* \$1360

[Click here for video solution to #3.](#)

- (4) How much should be placed into an account paying simple interest of 8% so that after six months the future value of the account will be \$1,000,000?

*Answer:* \$961,538.46

[Click here for video solution to #4.](#)



- (5) Suppose that \$20,000 is deposited into an account that yields an annual interest rate of 6.5%. How much will be in the account after 3 years if the account earns simple interest? How much will be in the account after 3 years if the account is compounded quarterly? How much more interest did the account earn when it was compounded quarterly?

*Answer:* After 3 years with simple interest the amount in the account is \$23,900. After 3 years compounded quarterly the amount in the account is \$24,268.15. There is \$358.15 more in the account when it is compounded quarterly compared to simple interest.

[Click here for video solution to #5.](#)

- (6) Suppose that \$20,000 is deposited into an account that yields an annual interest rate of 6.5%. How much will be in the account after 3 years if interest on the account is compounded continuously?

*Answer:* \$24,306.22

- (7) You have \$5000 in an account that pays 7.2% interest. The money remains in the bank for 9 years. How much is in the account at the end of the 9 years if the account is:
- compounded monthly?
  - compounded daily?
  - compounded continuously?
  - How much interest is earned with each of the different compounding periods?

*Answer:*

- \$9540.08
- \$9557.96
- \$9558.57
- Interest earned for the account compounded monthly is \$4540.08, daily is \$4557.96, and compounded continuously is \$4558.57.

[Click here for video solution to #7.](#)

- (8) One bank advertises a nominal rate of 7.1% compounded semiannually. A second bank advertises a nominal rate of 7% compounded daily. What are the effective yields for each bank. In which bank would you deposit your money to earn the most interest?

*Answer:* The first bank has an effective yield of 7.226%. The second bank has an effective yield of 7.25%. Because the effective yield in the second bank is higher, you should deposit the money in the second bank.

[Click here for video solution to #8.](#)



(9) Jane is debating on two different investment options shown below. Which option will optimize her investment?

- **Option 1:** Purchase a CD that matures in 12 years and pays interest upon maturity at the rate of 10% per year compounded daily.
- **Option 2:** Purchase a zero-coupon CD that will triple her investment in the same period.

*Answer:* Option 1 will optimize the value of the investment.

[Click here for video solution to #9.](#)

## Section 6.2

(10) Francisco deposits \$100 every month into an annuity at 5% annual interest compounded monthly, for 9 years. Find the future value and the amount of interest earned during this period. Round to the nearest penny.

*Answer:* The future value of the account is \$13,604.32. The interest earned on the account is \$2804.32.

[Click here for video solution to #10.](#)

(11) Daisey wants to save \$20,000 for a down payment on a car after she graduates from college. She opens an annuity at 2.25% annual interest compounded quarterly for 5 years. What is her quarterly payment?

*Answer:* \$947.61

[Click here for video solution to #11.](#)

(12) Molly's parents want to put money into a college fund, so she can better afford the cost of college. Her family figures they can afford to save \$300 per month. They find a bank that offers a 4.05% annual interest, compounded monthly. How many years do they need to plan to invest the money to have \$40,000 in the account when Molly goes to college.

*Answer:* It will take about 9.2 years for the account to grow to \$40,000.

[Click here for video solution to #12.](#)

(13) You owe \$6000 on a credit card that charges 21% annual interest compounded monthly on the unpaid balance. If you make monthly payments of \$120, how long will it take to pay it off? How much interest is paid in all? How much do you owe after 5 years of making payments?

*Answer:* It will take 10 years to pay off the credit card. \$8400 is paid in interest. \$4435.68 is still owed after 5 years of making payments.

[Click here for video solution to #13.](#)



- (14) You have announced to your company that you will retire in one year. Your pension plan requires the company to pay you \$40,000 in a lump sum at the end of one year and every year thereafter until your demise. The company makes the assumption that you will live to receive 25 payments. Interest rates are 5% per year compounded annually. What amount of money should the company set aside now to ensure that they can meet their pension obligations to you?

*Answer:* \$563,757.78

[Click here for video solution to #14.](#)

- (15) You wish to purchase a house that costs \$130,000. You make a down payment of \$20,000 and finance the remainder for 30 years at 5.1% annual interest compounded monthly on the unpaid balance.

- (a) What are your monthly payments?

*Answer:* \$597.24

- (b) How much interest is paid in all?

*Answer:* \$105,006.40

- (c) How much of the first payment is paid toward interest and how much is paid toward the current principle of the account?

*Answer:* Paid toward interest is \$467.50. Paid toward the principle is \$129.74.

- (d) Suppose you finance the house over 15 years instead of 30. What is the monthly payment and how much do you pay in total interest? How does the interest paid on a 15-year mortgage compare to the 30-year mortgage?

*Answer:* The monthly payment is \$875.61. The interest paid is \$47,609.80. You would save \$57,396.60 in interest with a 15-year mortgage instead of a 30-year mortgage.

- (16) A corporation wishes to set up a sinking fund to have the funds necessary to replace a current machine. It is estimated that the machine will need to be replaced in 10 years and cost \$100,000. How much per quarter should be deposited into an account with an annual interest rate of 8% compounded quarterly to meet this future obligation. What will be the total amount of the payments and interest earned? Just four years after making the sinking fund payment, the corporation decided to use the accumulated money (equity) for another purpose. Determine the equity.

*Answer:* Should deposit \$1655.75 each quarter.

Total amount of paid into account is \$66,222.80

Total interest earned is \$33,777.20.

The equity earned after 4 years is \$30,858.64.

[Click here for video solution to #16.](#)



- (17) You wish to borrow \$20,000 from the bank to purchase a car. The bank charges interest at an annual rate of 4.2% compounded monthly and you finance the loan for 5 years. What must the payments be so that the loan will be paid off after the 5 years? 4 years? 6 years? Find the total interest paid on the loan for each of the different loan periods. Find the total interest paid on the loan for each of the different loan periods.

*Answer:*

Payment for 5 year loan is \$370.14. Total interest for the 5 year loan is \$2208.40.

Payment for 4 year loan is \$453.37. Total interest for the 4 year loan is \$1761.76.

Payment for 6 year loan is \$314.73. Total interest for the 6 year loan is \$2660.56.

[Click here for video solution to #17.](#)

- (18) You borrow \$3000 at 12% annual interest compounded quarterly for 2 years. Show, using an amortization table, how much of each payment is interest, how much is paid towards the principal, how much of the loan is paid off and how much is still owed each quarter.

*Answer:*

End of Period	PMT	Interest	Toward Principle	Outstanding Principle
0	–	–	–	\$3000
1	\$427.37	\$90	\$337.37	\$2662.63
2	\$427.37	\$79.88	\$347.49	\$2315.14
3	\$427.37	\$69.45	\$357.92	\$1957.22
4	\$427.37	\$58.72	\$368.65	\$1588.57
5	\$427.37	\$47.66	\$379.71	\$1208.86
6	\$427.37	\$36.27	\$391.10	\$817.76
7	\$427.37	\$24.53	\$402.84	\$414.92
8	\$427.37	\$12.45	\$414.92	\$0

[Click here for video solution to #18.](#)



(19) You wish to purchase a house that costs \$130,000. You make a down payment of \$20,000 and finance the remainder for 30 years at 5.1% annual interest compounded monthly on the unpaid balance. The monthly payment on this home mortgage is \$597.24.

(a) Fill in the rows of the amortization table.

End of Period	Number of PMT remaining	PMT	Interest	\$ Toward Principle	Outstanding Principle	Equity
0						
1						
2						
3						
4						
5						
6						

*Answer:*

End of Period	Number of PMT remaining	PMT	Interest	\$ Toward Principle	Outstanding Principle	Equity
0	360	–	–	–	\$110,000	\$20,000.00
1	359	\$597.24	\$467.50	\$129.74	\$109,870.26	\$20,129.74
2	358	\$597.24	\$466.95	\$130.29	\$109,739.97	\$20,260.03
3	357	\$597.24	\$466.39	\$130.85	\$109,609.12	\$20,390.88
4	356	\$597.24	\$465.84	\$131.40	\$109,477.72	\$20,522.28
5	355	\$597.24	\$465.28	\$131.96	\$109,345.76	\$20,654.24
6	354	\$597.24	\$464.72	\$132.52	\$109,213.24	\$20,786.76

(b) How much equity will you have after 10 years?

*Answer:* \$40,255.93

(c) How much equity will you have after 18 years?

*Answer:* \$65,744.77

[Click here for video solution to #19.](#)