

Tutorial Worksheet #7
Tuesday, June 26

Name: _____

Student Number: _____

Write your solutions to the following exercises on the provided paper. *Show all of your work.* Remember to use good notation and full sentences.

1. What is the present value of an investment at 6% annual simple interest if it is worth \$8,000 in 4 years?
2. A student invests \$1000 in a savings account at 6% interest compounded semi-annually. How much is in the account after 4 years?
3. You are trying to decide whether to invest \$5000 with the bank or with the credit union. The bank offers a 7% interest rate compounded quarterly, and the credit union offers a 5% interest rate compounded weekly. Which savings account will give you more money in 6 years?
4. A man invests \$4000 in a savings account at 4% interest compounded monthly. How long (in years) until he has \$6000 or more in the account?
5. At what interest rate would an initial investment of \$2500 increase to \$4500 after 4 years, if the interest is compounded monthly?
6. A woman is negotiating interest rates with her bank. She received a gift of \$8000 from a relative, and wants to put it into a savings account. She wants the \$8000 to grow to \$10000 as soon as possible. The bank gives her two options:
 - 10% interest compounded quarterly,
 - or 6.5% interest compounded weekly.

Which should she choose?

7. A man decided to place \$100 every week into an annuity that paid 3%, compounded weekly, for 5 years. How much money did he have at the end?
8. You deposit \$200 each month into an account that pays 10%, compounded monthly. How much interest have you earned after 3 years?
9. A 13-year-old boy decides to save his pocket money so that he can afford a car when he turns 17. He decides to invest his money every week in an annuity. By the time he reaches 17, he hopes to have saved \$15,000.

- (a) How much does the boy need to invest each week if interest is 7% compounded weekly?
 - (b) If the boy only has \$40 to invest each week, how long will it take him to reach his goal of \$15,000?
10. You apply for a mortgage of \$250,000 in order to pay for a house. The interest is 3.5% compounded monthly.
- (a) If you wish to have the house fully paid for in 20 years, how much do you need to pay each month?
 - (b) If instead, you wish to have the house paid off in 25 years, what is your monthly payment?
11. You wish to buy an apartment costing \$180,000. In order to pay for it, you take out a mortgage amortized over 25 years with 5% interest compounded monthly.
- (a) What are your monthly payments?
 - (b) How much of your first monthly payment is interest?
 - (c) What is the remaining principal after 2 years? After 10 years?

Brief Answers:

- 1. $P = \$6,451.61$
- 2. \$1,266.77
- 3. The bank is the better choice.
- 4. $n = 121.84$, so 122 months, or 10 years and 2 months (even though the value is \$6,000 after 121.84 months, interest is not compounded until the end of the month, so there is not \$6,000 in the account after 121.84 months)
- 5. 14.79%
- 6. 10% compounded quarterly
- 7. \$28,042.56
- 8. \$1,156.36
- 9. (a) He needs to invest \$62.58 per week to reach \$15,000.
(b) 5.842 years
- 10. (a) \$1,449.90
(b) \$1,251.56
- 11. (a) \$1,052.26
(b) \$750
(c) After 2 years: \$172,387.24; after 10 years: \$133,064.05