

MATH 1030: Homework 7

due March 7, 2014

Instructions: Do the following problems on a separate sheet of paper. Show all of your work.

Book Exercises

§4C Exercises 63, 76, 77

Problem 1

Agent Cooper is interested in purchasing some retirement property at what he thinks “will be a very reasonable price.” Suppose his savings account compounds continuously with an APR of 4.65%.

- (a) Find the APY of his account.
- (b) Cooper wants to deposit some money into his account and leave it until he retires 25 years from now. Suppose he wants to have a total of \$150,000 in his account when he retires. How much should he deposit right now?

Problem 2

Her competition with Arthur has gotten Joanne thinking about her future. Her bank offers a savings account that compounds monthly at an APR of 3.8%. Suppose that she decides to deposit \$200 into her account each month until she retires in 35 years.

- (a) What will Joanne’s savings account balance be after the 35 years?
- (b) How much of the total was deposited by Joanne and how much did she earn in interest?
- (c) What percentage of the balance was earned in interest?

Problem 3

Joanne’s rival Arthur is still angry about not saving as much money as Joanne. He hears about Joanne’s plan to retire and he devises a plan to have a better retirement than her. His plan is to save enough money so that when he retires, he can live solely on the interest earned in the account. When he retires, he wants to have enough money in the bank so that he can earn a modest \$25,000 per year in interest alone. It turns out that Arthur banks at the same place as Joanne and has the same savings account that compounds monthly at an APR of 3.8%

- (a) What should the account balance be when Arthur retires so that he earns \$25,000 in interest each year?
- (b) Supposing Arthur also plans to retire 35 years from now, what monthly payment does he need to make in order to reach his goal?

Problem 4

Bonnie and Dexter are looking into buying a house. They secure a 30-year mortgage that compounds monthly at an APR of 7.1% for a house that costs \$230,000.

- (a) What will Bonnies and Dexters monthly payments be?
- (b) How much will they actually pay for the house?
- (c) Of the total amount paid, what percentage was paid in interest?
- (d) If Bonnie and Dexter decide to instead pay off the loan in 20 years, how much will their monthly payment be and how much (in dollars) will they save in interest?

Problem 5

Chester wants to buy a new car. His bank offers car loans that compound monthly at an APR of 6.2%. Suppose that he can only afford to pay \$350 per month towards a car loan.

- (a) If Chester takes out a 3-year loan, what is the largest loan amount that he can afford?
- (b) If Chester takes out a 4-year loan, what is the largest loan amount that he can afford?
- (c) If Chester takes out a 5-year loan, what is the largest loan amount that he can afford?