Name: _____
MATH 108
Spring 2023
HW 4: Due 02/08

"Don't look for the needle in the haystack. Just buy the haystack!"
–John Bogle

Problem 1. (10pt) Aaliyah is making her first big investment. She places $24,000 with a company that promises a return equivalent to 4.5% annual interest, compounded monthly.

(a) How much money will her investment be worth in 3 years?

(b) How much interest has she made in her investment after 3 years?

(c) If she had wants the investment to mature to $29,000 in only 3 years, how much should she invest now?

Problem 2. (10pt) Jordan is taking out a loan for $13,000. The agreement he negotiates with the bank is for a 5.3% annual interest rate, compounded continuously.

(a) How much will he owe after 5 years?

(b) How much interest will he have been charged on the loan after 5 years?

(c) If he knows that after 5 years he will have at most $45,000 to pay back on the loan, what is the most he can afford to borrow initially?

Problem 3. (10pt) An investment firm promises that if you place your money with them that you will see returns of 9.7% annual interest, compounded semiannually. You decide to place $86,000 with this firm.

(a) How long until your investment is worth $100,000?

(b) If instead they claimed the return was 9.7% annual interest, compounded continuously, how long until your investment would be worth $100,000?

(c) Why is your answer in (b) a shorter time period than your answer in (a)?

Problem 4. (10pt) A bank offers two different loan packages. One package offers a rate of 10.2% annual interest, compounded quarterly. The other package is for 10.1% annual interest, compounded continuously.

(a) 'At face value', which appears to be the better offer?

(b) Compute the effective interest rate for each package. Based on these interest rates, which is the better offer?

(c) Compute the doubling time for each package. Based on these times, which is the better offer?

(d) Explain the differences (if any) in your answers to (a), (b), and (c).