MAT133

WRITTEN HOMEWORK 1 **Due: Thursday, May 25, 2023 at 11:59pm**

All solutions to be written in appropriate details, and final answers should be rounded up to two decimal places where applicable. Please submit your solution to Crowdmark.

NOTE: *This version contain solutions to the problems. I did not write solutions in best details, so students are expected to fill in some of these gaps in their submissions.*

Question 1. a. If you deposit 3500 dollars into an account with an APR of 8% compounded quarterly, how long you should wait until there is 5000 dollars in the account?

Solution Let n be the amount of time in years needed to reach 5000 dollars, then the compounding formula leads to

$$5000 = 3500\left(1+\frac{0.08}{4}\right)^{4n} = 3500 \times 1.02^{4n},$$

where $4n$ represents number of compounding periods in n years. Hence,

$$n = \frac{\ln 5000 - \ln 3000}{4 \ln 1.02} \approx 4.5 \text{ years}.$$

b. You are thinking to buy a car 10 years from today. At that time, you expect the car to cost 60'000 dollars. You currently have 15'000 dollars to invest. What must be an APR of the investment account compounded monthly so that you can buy the car in 10 years?

Solution Let r represent an APR, then from the compounding formula we have