

Stat 274 — Winter 2024

Homework Assignment 2

Due: Thursday, January 25th on Learning Suite at 9:30 am

1. Suppose you deposit 10000 in an account with annually compounding interest of $i = 0.05$ and withdraw the money when the account reaches 15000.
 - (a) How long will it take? [8.3104]
 - (b) Find I_2 the amount of interest earned during the second year. [525]
 - (c) Find $I_{[7,9]}$ the amount of interest earned from time 7 to time 9. [928.996]
 - (d) What is the total interest paid on this transaction? [5000]
2. Find the accumulated value of 2480 at the end of twelve years if the nominal interest rate was 2% monthly for the first three years, the nominal rate of discount was 3% semiannually for the next two years and the rate of interest (convertible semiannually) was 4.2% for the next four years, and the annual effective rate of discount was 0.058 for the last three years. [3951.81]
3. Given equivalent rates $i^{(m)} = 0.0469936613$ and $d^{(m)} = 0.046773854$, find m . [10]
4. A savings account starts with 1000 and a level annual effective discount rate of 6.4%. Find the accumulated value at time 5. [1391.94]
5. The amount of (compound) interest on X for two years is 320. The amount of discount on X for one year is 148 (meaning that $X - 148$ at time 0 turns into X at time 1). Find the effective interest rate i and the value of X . [0.05311; 2934.68]
6. Given that $\delta_t = \frac{3t^2}{(1+t^3)}$
 - (a) Find $a(t)$
 - (b) Assuming an initial deposit of 2500, find $I_{[4,7]}$. [697500]

7. Given $a(t) = e^{0.04t+0.002t^2}$ find δ_3 . [0.052]
8. Alicia goes to the bank to finance a car. The banker gives her the option of an annual effective interest rate of 0.047 or an annual effective discount rate of 0.045. Which option should she choose? [The interest rate.]
9. Find and work 5 more practice problems. These will be graded, so be sure to include them in your submitted assignment. You can find them:
- In the online practice problems
 - In the study manuals in the library
 - In the book
 - Ask the TA's to write one
 - In your purchased software (Infinite Actuary, Coaching Actuaries, Actex, etc.)