

Test 1

100 Points (Time: 6:00 Minutes)

Instruction for all problems: Show your work. No round down or up, use 2 decimals for dollar values and 4 decimals for factors.

Question 1: (10+10+10+10 +10 points)

Use tables and interpolations.

Is this a profitable investment? Buy a production machine for \$30,000, receive profit of \$1,000 at the end of first year increasing geometrically 20% each year to year 10 and then decreasing arithmetically to year 20 with the year 20 profit the same as year 3 profit. Salvage value of the unit is \$5,000. Interest rate is 7.4% compounded bi-monthly.

Question 2: (20 points)

In cleaning out some files that were left behind by the engineer who preceded you in your current job, you found an old report that had a calculation for the present worth of certain maintenance costs for state highways. The report contained the following equation (with cost in \$1 million):

$$12\{1 - [(1 + 0.03)/(1 + 0.06)]^x\} / (0.06 - 0.03) = 140$$

The value of x that was used in the calculation was illegible. What is its value?

Your Name:

Question 3: (30 points)

On a student loan, you have received \$10,000 twice a year on January 1st and August 1st of each year for the last 9 semesters. Rate is 8% compounded monthly. Upon graduation, you start paying back your loan. What should your monthly payments be to pay back your loan in the same amount of months it took you to graduate? You began your education in Fall semester and graduated in December.