

Math 210, Lec. 3, Fall 1999

NAME:

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Discussion Day&Time:

EXAM 5, December 15, 1999

SCORE:

Some Formulas:

$$1 + a + a^2 + \cdots + a^n = \frac{a^{n+1} - 1}{a - 1} \text{ if } a \neq 1, \quad \text{APY} = 100 \left[ \left( \frac{A}{P} \right)^{1/t} - 1 \right]$$

$$I = Prt, \quad S = P(1 + k)^n, \quad S = \frac{Y}{k}((1 + k)^n - 1), \quad V = \frac{Y}{k}(1 - (1 + k)^{-n})$$

As usual there are four major questions I, III, II, IV. In this exam answers MUST be computed: money answers in dollars and cents e.g. \$153.37 and interest rates in the form 4.15% or .0415. Answers given with no indication of the reasoning involved are not acceptable. **You must show your work.**

**I. 20 points** Today is December 15, 1999. John is sitting on two loans from his friend Sally. In the first loan, John agreed to pay Sally \$1,500 on December 15, 2001. In the second loan, John agreed to pay Sally \$1,000 on December 15, 2004. Sally demanded an annual interest rate of 8.4%, with monthly compounding.

(a) John wishes to consolidate these two loans into one loan payable on December 15, 2003. **How much will he have to pay Sally on that date?**

(b) If John wanted to payoff the two loans today, December 15, 1999, **how much money would he have to pay Sally today?**

II. 25 points (a) A money lender charges a annual rate of 15%, compounded monthly. What is his actual annual percentage rate (the actual percentage yield in one year)?

(b) Frank buys a used car on January 1, 2000. The terms for financing are 7.2%, compounded monthly. There are to be monthly payments of \$250, at the end of the month, but a special arrangement is made so that the first payment is not due until July 31, 2001. If the number of payments is 48, what was the purchase price of the car?

III. 30 points Tom and Jane buy a house on a thirty-year mortgage of \$100,000 with an annual interest rate of 8%, compounded monthly.

(a) What are the monthly payments?

(b) How much is owed on the house at the end of 10 years?

IV. 25 points A municipal bond is advertised as follows: 10 year bond, redemptive value of \$20,000, semi-annual interest payments computed on the basis of 10% per year. You offer \$18,000 and, much to your surprise, your offer is accepted. What is the return on your investment, that is, the yield to maturity? (I expect an answer in the form of 5.13%.)