

Math 121 HW #1

Due Jan. 31

For problems in this assignment it may be useful to use a calculator. I do not expect anyone to own a calculator and it is not required for this assignment. You may leave problems in unevaluated form, but if you choose to use a calculator you must show your work.

Chapter 5.1

4. Suppose you are getting 5% APR compounded quarterly. What is the effective interest rate you are receiving?

8. Find the compound interest you receive on \$1000 invested for 5 years at a nominal rate of 7% for compounding:

- 8.a quarterly
- 8.b monthly
- 8.c weekly
- 8.d daily

9. Over a five-year period, an original principal of \$2000 accumulated to \$2950 in an account in which interest was compounded quarterly. Determine the effective rate of interest, rounded to two decimal places.

18. How long would it take for a principal of P to double if money is worth 12% compounded monthly?

25. As a hedge against inflation, an investor purchased a painting in 1990 for \$100000. It was sold in 2000 for \$300000. At what effective rate

did the painting appreciate in value?

Chapter 5.2

For the following problems, find the present value of the given future payment at the specified interest rate.

1. \$6000 due in 20 years at 5% compounded annually
4. \$1740 due in two years at 18% compounded monthly
7. \$8000 due in five years at 10% compounded quarterly

11. A bank account pays 5.3% annual interest, compounded monthly. How much must be deposited now so that the account contains exactly \$12000 at the end of one year?

21. Suppose that a person has the following choices of investing \$10000:

(a) placing the money in a savings account paying 6% compounded semiannually; or

(b) investing in a business such that the value of the investment after 8 years is \$16000.

Which is the better choice?

25. A promissory note is a written statement agreeing to pay a sum of money either on demand or at a definite future time. *Promissory notes can be dangerous - don't sign one.* When a note is purchased for its present value at a given interest rate, the note is said to be discounted, and the interest rate is called the discount rate. Suppose a \$10000 note due eight years from now

is sold to a financial institution for \$4700. What is the nominal discount rate with quarterly compounding?

Chapter 5.3

2. What amount of money will you have in your bank account if you invest \$6000 for six years at 9% compounded continuously?

5. What is the effective rate of interest on 4% compounded continuously?

12. A trust fund is being set up by a single payment so that at the end of 30 years there will be \$50000 in the fund. If interest is compounded continuously at an annual rate of 6%, how much money should be paid into the fund initially?

14. Will Smith has \$50000 lying around after his daughter released a hit single. She won't notice that money missing for 18 months, so Will has two possible investment strategies available:

(a) Invest the money in a certificate paying interest at the nominal rate of 5% compounded quarterly; or

(b) Invest the money in a savings account earning interest at the annual rate of 4.5% compounded continuously.

How much money will he make with each of these strategies?

18. If interest is compounded continuously, at what annual rate will a principal of P quadruple in 40 years?