## **FINANCE**

## **LECTURE EXAMPLES (THU NOV 21)**

If an amount of *P* dollars grows at an annual rate of *r*, which is compounded *n* times per year,

after *t* years, the total amount, *A*, will be  $A = P(1 + \frac{r}{n})^{nt}$ 

## NOTE: *r* is usually given as a percentage, but must be converted to a decimal for calculations.

Examples:

[a] Amir deposits \$500 into a savings account which earns 3.1% interest compounded twice a year. What is the value of his account 4 years later ?

A = P = r = n = t =

[b] Blanca deposits \$700 into a certificate of deposit (CD) which earns 2.9% interest compounded weekly. How many years later will the value of the CD be \$1000 ?

A = P = r = n = t =

[c] Carla buys a bond which earns 3.4% interest compounded every other month. She wants the bond to have a value of \$900 five years later. What is the value of the bond now ?

A = P = r = n = t =

[d] Dinh borrowed \$5000, and 6 years later (having made no payments), he owed \$8000. If the interest was compounded monthly, what was the annual interest rate on his loan ?

$$A = P = r = n = t =$$

## HOMEWORK (DUE IN CLASS ON MON NOV 25)

- [1] Show your work clearly and neatly.
- [2] Summarize each answer in a sentence.
- [3] All final answers which represent money should be rounded to the nearest cent.
- [4] All final answers which represent time should be rounded to 2 decimal places.
- [5] All final answers which represent rate should be percentages rounded to 4 decimal places.
- You invest \$1 at an interest rate of 100% compounded 1,000 times per year. What will it be worth at the end of the year ?
  For this question only, round your answer to 5 decimal places.
  (This example shows the significance of the special number *e*. OPTIONAL: Increase the number of compoundings to 1,000,000.)

[2] You put \$5,800 into an account that compounded daily, and grew to \$8,900 after 4 years. What was your investment's annual growth rate ? (For finance purposes, there are 365 days in a year.)

[3] Six years ago, you invested in a venture that grew by an annual rate of 5.1%, compounded every 3 months. If your investment is now worth \$7,400, how much did you originally invest?

You bought \$11,300 of a stock that is now worth \$17,000.
 If the stock's value increased 11.4% each year, how long ago did you buy the stock ?
 (Since no compounding is mentioned, it is implied that there is only 1 compounding per year.)

[5] Your gold jewelry tripled in value in 4 years. How much did its value increase each year ?

[6] Jamie and Terry just bought their first house together. They expect to do a \$24,000 remodel 7 years from now. How much should they deposit into an investment now to cover the cost of the future remodel, if the annual growth rate of the investment is 9.3%, compounded every 4 months ?

[7] When Lee and Taylor got married in June 2008, Lee's mother gave them a \$5,700 bond, compounded monthly, as a wedding present. As they celebrated their anniversary in June 2013, the bond was now worth \$8,900. What was the annual growth rate of the bond ?

[8] Morgan and Reese just deposited \$32,000 into an investment which grows by an annual rate of 7.8%, compounded weekly. They plan to quit their current jobs and open their own business when the investment reaches \$51,000. When will they be opening their new business ?

[9] To pay for college, Bailey borrowed \$31,000, which grew by 6.9% compounded quarterly (four times a year). If no payments were made for 5 years, what was the total owed at that time ?

[10] When Dana and Chris got married at the age of 27, they made a deposit into a savings account which grew by 3.6% compounded monthly. By the time their son got married, the account had doubled in value. How old were they when their son got married ?

In addition, do the related problems on the Midterm 3 review packet to make sure you are prepared for the finance problems on Midterm 3