If an amount of P dollars grows at an annual rate of r (usually given as a percent), then after t years, the total amount, A, will be

$$A = P(1+r)^{t}$$
, where *r* has been converted to a decimal

Examples:

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

A = P = r = t =

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

A = P = r = t =

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

A = P = r = t =

[d] Dinh deposits \$5000 into a speculative investment, and 6 years later, the investment is worth \$8000. What is the annual growth rate of the investment ?

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

## **HOMEWORK (DUE IN CLASS ON THU JUN 3)**

- [1] Solve the following problems on a <u>separate sheet of paper</u>.
- [2] Show your work clearly and neatly.
- [3] Summarize each answer in a sentence.
- [4] All final answers which represent money should be rounded to the nearest cent.
- [5] All final answers which represent time should be rounded to 2 decimal places.
- [6] All final answers which represent rate should be rounded to 4 decimal places.
- [a] When she graduated from high school, Bailey charged \$9,000 to her credit card to cover a lavish party, then didn't bother to look at or pay her bill. The interest, fees and fines caused her credit card balance to grow by 29% each year. When she finally looked at it, the balance was \$23,000. How long after Bailey charged her credit card did she finally look at her bill ?
- [b] Morgan and Reese plan to start a business 6 years from now. They expect the start-up costs to be \$32,000. How much should they invest now, if their investment is guaranteed to grow 7.6% annually, in order to cover the start-up costs 6 years from now ?
- [c] When Lee and Taylor got married in August 2008, Lee's mother gave them a \$5,700 painting as a wedding present. If the value of the painting increases 8.3% per year, how much will it be worth when Lee and Taylor celebrate their anniversary in August 2024 ?
- [d] Jamie and Terry just bought their first house together. They expect to do a \$24,000 remodel 7 years from now. If they deposit \$15,000 into an investment now, what annual growth rate must the investment achieve to cover the cost of the remodel 7 years from now ?
- [e] When Dana and Chris got engaged at the age of 25, Dana gave Chris an antique watch, which grew in value by 5.4% each year. By the time their daughter entered college, the watch had tripled in value. How old were Dana and Chris when their daughter entered college ?

## In addition, do the related problems on the Midterm 3 review materials to make sure you are prepared for this type of problem on the midterm.