

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 WED MAR 12)

- [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.**

- [1] 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 ?

- [4] 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