Calculating the Amount in an account for Compound Interest Paid *n* times a year

If you deposit *P* dollars at a rate *r* (in decimal form) subject to compound interest paid *n* times a year, then the amount, *A*, of money in the account after *t* years is given by

$$A = P\left(1+\frac{r}{n}\right)^{(nt)}$$

Annually n= ___ Semi-Annually n=___ Quarterly n=___ Monthly n=___Weekly n=___

Examples:

1. You deposit $1000 in a savings account at a bank that has a rate of 0.95%.

    a. Find the amount, A, of money in the account after five years, subject to interest compounded annually. Round to the nearest cent.

    b. Find the interest after five years.

2. You deposit $4200 in a savings account that has a rate of 1.125%. The interest is compounded quarterly.

    a. How much money will you have after ten years? Round to the nearest cent.

    b. Find the interest after ten years.

3. How much money should be deposited today in an account that earns 7% compounded monthly, so that it will accumulate to $10,000 in eight years?

4. If John invests $2300 in a savings account with a 9% interest rate compounded quarterly, how long will it take until John's account has a balance of $4150?

5. What interest rate compounded daily (365 days/year) is required for a $22,000 investment to grow to $36,500 in 5 years?

Calculating the Amount in an account when Compounding Interest Continuously

If you deposit *P* dollars at a rate *r* (in decimal form) and the interest is compounded continuously, then the amount, *A*, of money in the account after *t* years is given by

$A = Pe^{(rt)}$ where $e \approx 2.71828$(use the e^x button on your calculator)

Examples:

6. A single payment of $10,000 is invested at an annual rate of 8%, compounded continuously. Find the balance in the account after 5 years.

7. You have deposited $1000 in an account that pays 6.25% interest compounded continuously. How long will it take for your money to double?

8. When your initial investment is earning interest in an account with continuous compounding, find the missing information given the various conditions.

a) Initial Investment: $12,500 APR 9% Time to double your money? Amount in 15 years?

b) Initial Investment: $9,500 APR ? Time to double your money: 4 years Amount in 15 years?