Compound Interest Notes

Name _____ Class Period_____

Consider an initial principal ***P*** deposited in an account that pays interest at an annual rate ***r*** (expressed as a decimal), compounded ***n*** times per year. The amount ***A*** in the account after ***t*** years can be modeled by this equation:

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

Compounded:

- Yearly: n =
- Monthly: n =
- Annually: n =
- Semiannually: n =
- Quarterly: n =
- Daily: n =
- Weekly: n =

Examples:

1. You deposit $1000 in an account that pays 4% annual interest. Find the balance after 3 years if the interest is compounded quarterly.

2. You deposit $2500 in an account that pays 3.5% annual interest. Find the balance after 6 years if the interest is compounded monthly.

3. You deposit $500 in an account that pays 8.5% annual interest. Find the balance after 10 years if the interest is compounded semiannually.

4. If an investment company pays 7% compounded monthly, how much should you deposit now to have $9,000 7 years from now?

5. You deposit $25000 in an investment that pays 15% annual interest. Find the balance after 20 years if the interest is compounded annually.

6. At age 27, Jill deposited $4,000 into an IRA, where it earns 9.8 % interest compounded monthly. What will it be worth when she is thirty-five?

7. Susie B. Rich won $75,000 in the lottery. She invests her winnings into an account with a 3% yearly interest rate that compounds monthly.

A. How much money will she have after 1 year?

B. How much money will she have after 5 years?

C. Bank 2 is offering a 3% interest rate and compounds weekly. How much would she have after 1 year?

D. Bank 3 is offering a 2.9% interest rate and compounds weekly. How much would she have after 1 year?

E. Which bank should she invest her money in? What has a bigger impact: compounding or the interest rate?

8. Parker owes $5000 on a credit card his parents gave him. The card earns 18% interest compounded monthly. If he does not make a payment on the credit card, how much will he owe at the end of one year? Two years?

9. What will a $210,000 house cost 10 years from now if the inflation rate over that period averages 3% compounded annually?

10. You deposit $500 in an account that pays 3.25% annual interest compounded monthly. How much will be in the account in 5 years?

11. If an investment company pays 6% compounded semiannually, how much should you deposit now to have $10,000 5 years from now?

12. A $175,000 loan compounded monthly at 3.2% for 19 years. How much interest was earned?

13. You deposit $3500 in an account that pays 5.25 % annual interest. Find how long it will take for the amount to double if the interest is compounded annually.