

6.3.D1 ~ Compound Interest

True or False?

1. If an investment earns 5% compounded monthly, its effective rate will be more than 5%.
2. Investing \$10,000 for 20 years at 5% earns more if interest is compounded quarterly than if it is compounded annually.
3. If \$1000 is deposited into an account, the difference between bank account A that pays 12% interest compounded annually and bank account B that pays 12% interest compounded monthly is \$6.83 after the first year.
4. If you put \$1000 into an account that earns 5.5% compounded daily, then it takes about 18 years for the investment to grow to \$2000.
5. At the beginning of the year you deposit P dollars in an account paying interest at a nominal rate of 4% per year compounded quarterly. After three years, the balance has increased by a factor of 1.126825.

Suppose \$1520 is deposited into an account paying interest at a nominal rate of 8.5% per year. Write a formula for the balance, B , as a function of time, t . Then find the balance three years later if the interest is compounded...

6. Quarterly

7. Monthly

8. Joelle invests \$8000 into a retirement account with a 9% interest rate compounded monthly. Write an equation for the balance, B , as a function of time, t .

9. You deposit \$2000 in an account that earns 5% annual interest compounded monthly. Write an equation for the balance, B , as a function of time, t . (Round the growth factor to 4 decimal places.)

What are the nominal and effective annual rates for an account paying the stated annual interest, compounded... Round effective rates to 3 decimal places.

10. 6%

	Nominal	Effective
Quarterly?		
Daily?		

11. 11%

	Nominal	Effective
Weekly?		
Monthly?		

12. You are 25-years-old and begin to work for a large company that offers you two different retirement options.

OPTION 1: You will be paid a lump sum of \$20,000 for each year you work for the company.

OPTION 2: The company will deposit \$10,000 into an account that will pay you 12% annual interest compounded monthly. When you retire, the money will be given to you.

Let A represent the amount of money you will have for retirement after t years.

- a. Write a linear equation that represents Option 1.
- b. Write an exponential equation that represents Option 2.
- c. If you plan to retire at age 65, which would be the better plan? Explain your reasoning.
- d. If you decide to retire at age 55, which would be the better plan? Explain your reasoning.

Use the given information to determine the future value of each CD when it matures, assuming the minimum amount is invested.

13. Bank of America

- Minimum investment: \$1000
- Nominal rate: 3.64%
- Compounded monthly
- Maturity: 5 years

14. First Arizona Savings

- Minimum investment: \$500
- Nominal rate: 4.91%
- Compounded quarterly
- Maturity: 3 years

15. Use the given information to determine which CD will have a higher annual percentage yield (APY). Fireside Bank offers a nominal rate of 5.10% compounded monthly and Discover Bank offers a nominal rate of 5.07% compounded daily. *Show all work and explain how you obtained your answer.*