

Advanced Algebra
Homework 8.3
Compound Interest

Name _____

Period _____

SHOW ALL WORK.

Complete Parts A & B OR Parts B & C

PART A:

1. You deposit \$2000 in an account that pays 2.1% annual interest compounded continuously. What is the balance after 5 years?

2. You deposit \$800 in an account that pays 1.65% annual interest compounded continuously. What is the balance after 12.5 years?

3. You deposit \$2200 in a bank account. Find the balance after 4 years for each of the situations described below.
 - a. The account pays 3% annual interest compounded quarterly.

 - b. The account pays 2.25% annual interest compounded monthly.

 - c. The account pays 2% annual interest compounded daily.

4. You want to have \$3000 in your savings account after 3 years. Find the amount you should deposit for each of the situations described below.

a. The account pays 2.25% annual interest compounded quarterly.

b. The account pays 3.55% annual interest compounded monthly.

c. The account pays 4% annual interest compounded yearly.

PART B:

5. What interest rate, compounded monthly, would be required for a \$500 deposit to double in 10 years?

6. How long would it take for a \$500 investment, with an annual interest rate of 5% compounded continuously, take to grow to \$900?

7. Your goal is to have \$10,000 to buy a used car in 8 years. How much would you need to deposit today if your account pays 2.5% annual interest, compounded continuously?

8. What interest rate, compounded continuously, would be required for a \$200 deposit to grow to \$300 in 5 years?

9. How long would it take for a \$200 investment, with an annual interest rate of 4.1% compounded monthly, take to grow to \$350?

10. You take out a student loan to pay for college. The annual interest rate is 4.29%, compounded yearly. If you borrow \$100,000, and your goal is to back the loan in 10 years, what will your monthly payment be?

11. You save \$150 per month, which you invest with an annual rate of return of 3%, compounded quarterly. How much money will you have in 30 years?

12. You have a \$500 balance on a credit card, charging 17.5% annual interest, compounded monthly. If you make monthly payments of \$25.00, how many payments are required, and how long will it take to pay off the balance?

PART C:

13. Is investing \$3000 at 6% annual interest and \$3000 at 8% annual interest equivalent to investing \$6000 at 7% annual interest? Explain.

14. The height y (in feet) of the Gateway Arch in St. Louis, Missouri can be modeled by the function $y = 757.7 - 63.85(e^{\frac{x}{127.7}} + e^{\frac{-x}{127.7}})$ where x is the horizontal distance (in feet) from the center of the arch.

a. Use a graphing calculator to graph the function. How tall is the arch at its highest point?

b. About how far apart are the ends of the arch?