

Math III H. Homework

Name _____

1. You buy a new car for \$24,000. The value of the car depreciates by 16% each year.
 - a) Write an exponential model for the value of the car.
 - b) Estimate the car's value after 2 years.
 - c) Estimate when the car will have a value half of its original value.

2. Ms. Austin bought a house with a value of \$169,000. The house has an appreciation value of 7.96%.
 - a) Write the exponential decay function the value of Ms. Austin's house for x number of years.
 - b) Find the value of her house in 10 years.

3. You have inherited land that was purchased for \$30,000 in 1960. The value of the land increased by approximately 5% per year.
 - a) Write a model for the value of the land x years after 1960.
 - b) What was the approximate value of the land in the year 2010?
 - c) After what year will the land be valued at about half a million dollars?

4. Suppose you invest \$3000 at an annual interest rate of 3.5%, compounded quarterly.
 - a) Write an exponential model using the formula:
$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$
 - b) How much will you have in the account after five years?
 - c) After how long will you have \$3000 in the account?

5. At your birth, your grandmother invested \$500 into an account for you that was compounded continuously at a rate of 6.5%.
 - a) Write an exponential model using our continuously compounded interest formula.
 - b) How much money will you have in the account on your 18th birthday?
 - c) How long will it take for your money to grow to \$2000?
 - d) How long will it take for your money to double?

Compound Interest Problems

1. You deposit \$10,000 in an account that pays 6% interest. Find the balance after 10 years if the interest is compounded
 - a) quarterly
 - b) continuously
2. \$2000 is deposited in an account that pays 8% annual interest, compounded monthly. What is the balance after 5 years?
3. A parent, following the birth of a child, wants to make an initial investment that will grow to \$10,000 by the child's 20th birthday. Interest is compounded continuously at 8%. What should that initial investment be?
4. A student wants to save \$8,000 for college in four years. How much should be put into an account that earns 5.2% annual interest compounded continuously?
5. How long would it take to double your principal at an annual interest rate of 8% compounded continuously?
6. Suppose you invest \$2000 at an annual interest rate of 4.5% , compounded quarterly.
 - a) How much will you have in the account after five years?
 - b) Determine how much more you would have if the interest were compounded continuously.