

Exponential growth and decay.

Growth

$$Y = a(1 + r)^t$$

$a =$  the beginning amount

$r =$  percent of increase

$t =$  number of years

Decay

$$y = A(1 - r)^t$$

$a =$  beginning

$r =$  percent of decrease

$t =$  number of years

Use the formulas to find solve the following.

You put \$2500 in the bank in an account that pays 4% interest compounded yearly. Find the balance after 9 years.

$$y = 2500(1 + .04)^9$$

put into calculator as written

$$2500(1 + .04)^9$$

This is a carat  $\wedge$  -

It means raised to a power

In 9 years - your

\$2,500 will be \$3,558.28

You buy a car for \$20,000. It depreciates 18% each year. What will the value of the car be in 8 years?

$$y = 20,000(1 - .18)^8$$

$$20,000(1 - .18)^8$$

In 8 years, your \$20,000 car will be worth

\$4,088.28

Name \_\_\_\_\_ Period \_\_\_\_\_

## Unit 2 - Section 4 Homework

Answer each of the following using either the exponential growth formula or the exponential decay formula.

## Exponential Growth

$$A = P(1 + r)^t$$

## Exponential Decay

$$A = P(1 - r)^t$$

1. You deposit \$5400 in an account that pays 10% interest compounded yearly. Find the balance after 9 years.

Equation:

Balance after 9 years:

2. A car valued at \$21,000, depreciates 1% a year. Find the value of the car after 8 years.

Equation:

Balance after 8 years:

3. A car valued at \$42,000, depreciates 3.5% a year. Find the value of the car after 7 years.

Equation:

Balance after 7 years:

4. You deposit \$12,300 in an account that pays 7% interest compounded yearly. Find the balance after 6 years.

Equation:

Balance after 6 years:

5. You deposit \$32,600 in an account that pays 11.5% interest compounded yearly. Find the balance after 5 years.

Equation:

Balance after 5 years:

Name \_\_\_\_\_

### Exponential Growth and Decay Problems

Answer the following questions. If necessary, please round answers to the nearest whole number.

6. In 1985, there were 285 cell phones subscribers in the small town of Centerville. The number of subscribers increased by 75% per year. How many cell phone subscribers were in Centerville 5 years later?
  
7. You have inherited land that was purchased for \$30,000 in 1960. The value of the land increased by approximately 5% per year. What is the approximate value of the land in the year 2013?
  
8. A dish has 212 bacteria in it. The population of bacteria will grow by 80% every 2 days. How many bacteria will be present in . . . (Think about percent per day)
  - a) 4 days
  
  - b) 8 days
  
  - c) 11 days