



# exp 3

1.

Exp 3 HW

Advanced Algebra II

1. A comic book is worth \$3.50 today and its value will grow at the rate of 8% per year.

Find the equation that models this situation.

a.  $y = 3.50(1.08)^x$

Find the value of the comic book after 12 years.

1.  $3.50(1.08)^{12} = 8.81\$$

2. A house is worth \$200,000 today and its value will appreciate at the rate of 4% per year.

a. Find the equation that models this situation.

a.  $y = 200,000(1.04)^x$

Find the value of the house after 15 years.

1.  $200,000(1.04)^{15} = 360188.70\$$

3. A forest is currently home to 500 eagles, but the eagle population is decreasing at the rate of 5% per year.

a. Find the equation that models this situation.

a.  $y = 500(.95)^x$

Find the population of eagles after 20 years.

1.  $500(.95)^{20} = 179$

4. A town has a population of 6000 people. Due to a poor economy, the population is decreasing at a rate of 2% per year.

a. Find the equation that models this situation.

- a.  $y = 6000(.98)^x$
  - b. Find the population of the town after 100 years.
  - c.  $6000(.98)^{100} = 796$
5. Your next door neighbor offers to pay you to work for him for the next 30 days. He says he will pay you \$500 per day or the following plan. Day 1 you'll make \$0.01, day 2 \$0.02, day 3 \$0.04 and so on (every day he'll double your pay).
  - a. How much money would you make on day 30 of both options?
$$500(30) = 15000, .05 (2)^{30} = 53687091.2$$
  - b. Which option should you choose?

option 2
6. A certain drug has a half-life of 5 hours. Suppose you take a dose of 750 milligrams of the drug.
  - a. Find the equation that models this situation.
$$y = 750(.5)^{x/5}$$
  - b. How much of the drug is left in your bloodstream 24 hours later?
$$750(.5)^{24/5} = 26.92g$$
7. A certain radioactive isotope has a half-life of 16 days. There are 15 grams of the isotope.
  - a. Find the equation that models this situation.
$$y = 15(.5)^{x/16}$$
  - b. How much is left in 4 days?
$$15(.5)^{1/4} = 12.161$$
8. Determine if the following model exponential growth or decay. Determine the % of growth or decay
  - a.  $y = 6(3.1)^x$

Growth

  - b.  $y = 2(0.21)^x$

decay

  - c.  $y = 0.8(2)^x$

growth

d.  $y = 0.8(-0.3)^x$

neither