ALPHA: A bank account balance starts with $100 and has an annual interest rate of 4%.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the amount in the account after 12 years:

e. When will the balance reach $500?

CHARLIE: In 1985, there were 285 cell phone subscribers in the town of Centerville. The number of subscribers increased by 15% per year after 1985.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many cell phone subscribers were in Centerville in 1994?

e. When will the number of subscribers reach 2000?

ECHO: Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many players remain after 5 rounds?

BRAVO: The population of Winnemucca, Nevada, can be modeled by $P=6191(1.04)^t$ where t is the number of years since 1990.

a. Identify the growth factor (g):

b. Identify the percent increase:

c. Identify the y-intercept (b):

d. What was the population in 1990?

e. Find the population in the year 2015.

DELTA: You have inherited land that was purchased for $30,000 in 1960. The value of the land increased by approximately 5% per year.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. What is the approximate value of the land in the year 2011?

e. When was the land valued at $40,000?

FOXTROT: An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How much ibuprofen is left after 6 hours?

e. When will there be less than 20 mg remaining?

GOLF: You deposit $1600 in a bank account. Using the compound interest formula:

$A = P\left(1 + \frac{r}{n}\right)^{nt}$ where A = amount in the account, P = amount invested, r = interest rate as a decimal, n = # times interest is calculated per year, t = # years

Find the balance after 3 years for each of the following situations:

a. The account pays 2.5% annual interest compounded monthly.

b. The account pays 1.75% annual interest compounded quarterly.

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

INDIA: You buy a new computer for $2100. The computer's value decreases by 50% annually.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the value of the computer after 3 years.

e. When will the computer have a value of $600?

HOTEL: You drink a beverage with 120 mg of caffeine. Each hour, the caffeine in your system decreases by about 12%.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How much caffeine will be left in your system after 2 hours?

e. How long until you have 10mg of caffeine?

JULIETT: The population of a bacteria culture doubles after 1.5 hours. An experiment begins with 620 bacteria. Determine the number of bacteria after

a. 3 hours c. 10 hours e. 3 days

b. 6 hours d. 1 day f. 1 week

KILO: The foundation of your house has about 1,200 termites. The termites grow at a rate of about 2.4% per day.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many termites will there be after 10 days?

d. How long until the number of termites doubles?

LIMA: The world population in 2000 was approximately 6.08 billion. The annual rate of increase was about 1.26%. Let x be the number of years past the year 2000.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the population in 2015.

e. When will the population reach 10 billion?

NOVEMBER: The population of sasquatches was 2400 in the year 1900. They have been decreasing at a rate of 5% per year.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many sasquatches were there in 1930?

e. How many are left today, in 2015?

PAPA: A baseball card was bought for $0.25 in 1970. It's value increased 3% each year.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. Find its value today, in 2015.

e. When will it be worth $5.00?

MIKE: The bear population increases at a rate of 2% per year. There are 1573 bear this year.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many bears will there be in 10 years?

e. When will the bear population reach 2500?

OSCAR: The population of an endangered bird is decreasing at a rate of 0.75% per year. There are currently about 200,000 of these birds.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many birds will there be in 100 years?

e. When will the bird population reach 50,000?

QUEBEC: The value of a stock when purchased was $10 a share. The stock grew at a monthly rate of 7%.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the value of the stock after 1 year.

e. Find the number of months it took to reach a value of $15.75 a share.

ROMEO: Acetaminophen is metabolized at a rate of about 22% per hour. Suppose you take 500 mg.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How many mg are left after 4 hours?

e. When will the number of mg be less than 5?

TANGO: After an accident at a nuclear power plant, which caused a radiation leak, the radiation level at the accident was 950 roentgens. Five hours later, the radiation level was 800 roentgens. Radiation levels decay exponentially.

a. Find the <u>hourly</u> rate of decay (g). Justify your answer.

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the radiation level after 1 day.

e. Find when the level drops below the safe level of 25 roentgens.

SIERRA: Annie bought a new car for $35,000 and sold it 5 years later for $18,475. Assume that the value of the vehicle depreciated exponentially.

a. Find the <u>yearly</u> rate of decay/depreciation (g). Justify your answer.

b. Identify the y-intercept (b):

c. Write the equation:

d. Find the value after 10 years.

e. Find when the level drops below $1000.

UNIFORM: Ben bought a snowmobile for $12,000. It depreciates at a rate of 14% each year.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How will the value be in 10 years?

e. When will the value go below $8000?

VICTOR: Jerry is losing weight. Right now he weighs 250 pounds and is losing 2% of his body weight each week.

a. Identify the growth factor (g):

b. Identify the y-intercept (b):

c. Write the equation:

d. How much will he weigh in 6 weeks?

e. When will his weight go below 200 pounds?