Exponential Functions

Exponential Model: $y = ab^x$ a = _____ b = _____

Exponential Growth: _____ Exponential Decay: _____

r = _____

1) The world population in 2000 was approximately 6.08 billion. The annual rate of increase was about 1.26%. (a) Find the growth factor for the world's population. (b) Suppose the rate of increase continues to be 1.26%. Write a function to model world population growth.

2) A computer valued at $6500 depreciates at the rate of 14.3% per year. (a) Write a function that models the value of the computer. (b) Find the value of the computer after three years.

3) The value of an industrial machine decreases 25% per year. After six years, the machine is worth $7500. What was the original value of the machine?

Half Life: _____

The half life of a substance is the time it takes for half of the material to _____

4) A 3000-mg sample of a certain radioactive element has a half life of 3 seconds. How much of the sample remains after 1 minute?

5) Arsenic-74 is used to locate brain tumors. It has a half life of 17.5 days. Write the exponential decay function of a 90-mg sample. Use the function to find the amount remaining after 6 days.

6) Phosphorus-32 is used to study a plant's use of fertilizer. It has a half life of 14.3 days. Write the exponential decay function for a 50-mg sample. Find the amount of phosporus-32 remaining after 84 days.

Compound Interest:

The compound interest formula for the amount A in an account is _____.

P = _____ r = _____

n = _____ t = _____

7) Jodie's parents started a savings account for her when she was born. They invested $500 in an account that pays 6% interest compounded annually. Find the balance of the account after three years.

8) Graham's grandparents started a savings account for him when he was born. They invested $100 in an account with 8% annual interest compounded quarterly. How much is in his account on his 16^{th} birthday?

Interest Compounded Continuously: _____

9) Suppose your ancestor deposited $5 in an account with an annual interest rate of 3.5% compounded continuously. If the money was first deposited 200 years ago, what is the value of the account today?

10) Suppose you invest $1050 at an annual interest rate of 5.5% compounded continuously. Find the amount in the account after 5 years.