

Day 02 Exponential Growth and Decay Applications

Name _____

Date _____ Block _____

Take the following steps to solve each word problem.

1. Read the problem to determine whether it represents growth, decay, or compound interest.
2. Write down the correct formula and reread the problem.
3. Substitute the given values into the formula.
4. Solve the equation for the variable.
5. Write your answer in a complete sentence.

1. Your grandparents gave you \$2000 the day you were born. Your parents put this gift into a savings account that pays 4.5% interest compounded quarterly. Today is your 16th birthday and you go to the bank to withdraw your money to purchase your first car. The car you want cost \$5,526. Do you have enough money? If not how much more do you need?

2. In 1990, the annual out of state tuition at Florida State University was \$2,200. During the next 10 years, tuition increased by 6.2% each year.

a. Write an exponential growth model for the cost of tuition. _____

b. What is the “growth factor?” _____

c. Graph the model using the TI83-84. What is the y-intercept??? _____

d. What does x represent? _____ What does y represent? _____

e. What is a good window for this function? Make a “sketch” to the right.

Xmin: Xmax: Xscl: Ymin: Ymax:

f. Estimate the year when the tuition was \$3,500. _____

g. What was the tuition in 2005? _____ What was the tuition in 2010? _____

h. What will the tuition be the year YOU are ready to enter college?

Current Status	Year you enter College	Tuition
Freshmen		
Sophomores		
Juniors		
Seniors		

3. Radioactive Decay: Ten grams of Carbon 14 is stored in a container. The amount C (in grams) of Carbon 14 present after t years can be modeled by $C = 10(0.99987)^t$. How much Carbon 14 is present after 1000 years?

4. Erik bought a new computer for \$3,200. The value of the computer will decrease by about 50% annually.
- Write an exponential decay model for the value of the computer. _____
 - What is the “decay factor?” _____
 - Using the model, estimate the value of your computer after 2 years. _____
 - Graph the model using the TI-83 or 84 and the appropriate window. What is the y-intercept? _____
 - What is a good window for this function? Make a “sketch” to the right.

Xmin:	Xmax:	Xscl:	Ymin:	Ymax:
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 - When will the computer will be worth \$600? _____ When will it be less than \$100? _____
5. The number of newly reported cases of tuberculosis (in thousands) in the United States from 1991 to 1996 can be approximated by the equation $T = 28.5(0.9567)^t$, where t represents the number of years since 1990.
- What is the initial amount? _____ the decay factor? _____ the annual % decrease? _____
 - When was the number of newly reported cases approximately 25,000? _____
 - Graph the model using the TI-83 or 84 and the appropriate window. What is the y-intercept? _____
 - In what year were there 16,000 newly reported cases? _____
 - Estimate the number of newly reported cases in 2005. _____
6. If \$700 is deposited into an account that pays 4.3% interest compounded monthly, what would the balance in the account be after 7 years? (p. 488, #20)
7. Determine how much is in a retirement account after 20 years if \$5000 was invested at 6.05% interest compounded weekly. (p. 488, #21)
8. A college savings account pays 13.2% annual interest compounded semi-annually. What is the balance of an account after 12 years if \$21,000 was initially deposited? (p. 488, #23)