Exponential Growth, Decay, Compound Interest Models Take Home Quiz

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Compound Interest Formula Growth Formula Decay Formula**

$y=a(1+\frac{r}{n})^{t∙n}$$y=a(1+r)^{t}$$y=a(1-r)^{t}$

**Multiple Choice. Choose the best answer**

1. The population of Hybart City was 3,381,000 in 1994, and is growing at an annual rate of 1.8%. If this growth continues, what will the approximate population of Hybart City be in the year 2000?

a) 3,696,000 b) 3,798, 000 c) 3,763,000 d) 3,831,000

1. A student’s desk contained 3,842,700 bacteria cells on one day and is growing at a daily rate of 6.8%. How many cells would be present 4 days later?

a) 4,999,442 b) 5,043,878 c) 5,339,404 d) 15,370,800

**Solve the following problems. Round appropriately. SHOW ALL WORK FOR FULL CREDIT!**

1. A group of 10 students returns to school from Spring Break with a rare tropical virus. If the virus is estimated to spread at a rate of 18% each day, how many students will be affected after 1 week?
2. You want to have $20,000 saved for a down payment on a car 5 years from now. How much do you need in your account currently if the 5% interest is compounded monthly?
3. Mr. H’s truck is loses its value each year; it now has a blue book value of $7,856.38. If the car was purchased in 2006 for $48,000, what is its estimated rate of depcreciation?
4. It takes 10 years for half of the mass of a radioactive particle to decay. What is the rate at which the particle decays?
5. The equation P = 25,000(1 + .2)t models the growth of the population of a small town where t = the number of years since 1990.
	1. What was the population in 1990?
	2. By what percentage is the population increasing each year?
	3. What is the projected population for the year 2015?

**Do the following functions represent growth or decay? Graph and analyze.**

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| 8. f(x) = (2) x - 2 - 4 Growth or Decay? Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_Range: \_\_\_\_\_\_\_\_\_\_\_\_\_Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_  | graphc9. f(x) = ($\frac{1}{2}$) x + 3  + 5 Growth or Decay?Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_Range: \_\_\_\_\_\_\_\_\_\_\_\_\_Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_ |