# Algebra 2 Exponential/Logarithm Applications Name:

1. A new car that sells for $28,000 depreciates 25% each year. Write a function that models the value of the car. Find the value of the car after 4 years.
2. The bear population increases at a rate of 2% each year. There are 1573 bear this year. Write a function that models the bear population. How many bears will there be in 10 years?
3. The population of an endangered bird is decreasing at a rate of 0.75% per year. There are currently 200,000 of these birds. Write a function that models the bird population. How many birds will there be in 100 years?
4. Find the amount in a savings account with a principal of $5000 and an annual interest rate of 3.9% compounded continuously for 15 years.
5. Suppose you invest $2000 at an annual interest rate of 4% compounded monthly. How much will you have in the account after 10 years.
6. Hg-197 is used in kidney scans. It has a half-life of 64.128 hours. Write the exponential decay function for a 12-mg sample. Find the amount remaining after 72 hours.
7. The formula gives the power output *P*, in watts available to run a certain satellite for *t* days. Find the power the satellite needs to run for 40 days.
8. The formula for the maximum velocity of *v* of a rocket is , where *c* is the velocity of the exhaust in km/s and *R* is the mass ratio of the rocket. A rocket must reach 7.8 km/s to attain a stable orbit. Find the maximum velocity of a rocket with a mass ration of 18 and an exhaust velocity of 2.2 km/s. Can this rocket achieve a stable orbit?

# Algebra 2 Exponential/Logarithm Graphs Name:

Sketch a graph of each function. Label two points and label any asymptotes.