# Honors Algebra II <br> Notes Section 4.2 <br> Graph Exponential Decay Functions 

## VOCABULARY

Exponential Decay Function: $\qquad$

Exponential Decay Model: $\qquad$

Decay Factor: $\qquad$

## Parent Function for Exponential Decay

The function $f(x)=b^{x}$, where $0<b<1$, is the parent function for the family of exponential decay functions with base $b$. The general shape of the graph of $f(x)=b^{x}$ is shown below.


The domain of $f(x)=b^{x}$ is all real numbers. The range is $y>0$.

EXAMPLE 1 Graph $\mathrm{y}=(1 / 5) \times$.


Domain: $\qquad$


## Range:

$\qquad$

## Example 2 Graph the following exponential functions.

a) $y=2(1 / 4) x$
b) $y=-3(2 / 5)^{x}$



EXAMPLE 3 Graph $y=3(1 / 2)^{x+1}$. State the domain $\&$ range.



Domain: $\qquad$
Range: $\qquad$

EXAMPLE 4 A new snowmobile costs $\$$ decreases by $10 \%$ each year.
a) Write an exponential decay model giving the snowmobile's value y (in dollars) after $\dagger$ years.
b) Graph.
c) Estimate teh value after 3 years.
d) Use the graph to estimate when the value of the snowmobile will be ṣ 2500 .


