7.1 Exploring Exponential Models

a. I can determine if an exponential equation or scenario is a growth or decay function

b. I can create and solve an exponential function to model a situation.



Recall our standard forms of Exponential Growth and Decay functions which we used TO GRAPH:

**Growth Function** 

 $y = a(b)^{x-h}+k$ 

where b > 1

**Decay Function** 

 $y = a(b)^{x-h}+k$ 

where 0 < b < 1

## Formula for Exponential Growth

When a real life quantity *increases* by a fixed % each year, the ending amount, y, after t years can be modeled with the following formula:

Enaing  
Amount 
$$\rightarrow y = P(1+r)^t$$
  
Fincipal  
Ratz  
Reginning  
Ratz  
Amount decimal  
Reginning  
Ratz  
Amount decimal

1) In 1990, the population of Stars Hollow was 6,191 and the population was increasing by 4% each year.

a. Using the Formula for Exponential Growth, write an equation that models the situation over any given time, t. / ~ +

y = 6191(1+.04)

y = 6191(1+.04)''

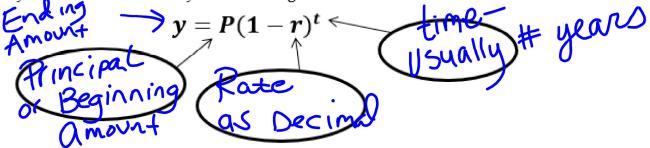
y=9530.8-79

b. Using your equation from part A, determine Stars Hollow population in 2001. 2001 - (990 - 1)

ヒ=4

## Formula for Exponential Decay

When a real life quantity *decreases* by a fixed % each year, the ending amount, y, after t years can be modeled by the following formula:



2) You buy a new car for \$24,000. The car depreciates by 16% each year.

a. Using the Formula for Exponential Decay, write an equation that models the situation over any given time, t.

$$y = 24000(1 - .16)$$

b. Using your equation from part A, determine the value of the car after 4 years.

Homework - Worksheet