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.

p. 26-27   Exponential Growth and Decay Models   7.1

p.26

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

Growth Function	**Decay Function**
$y = a(b)^{x-h}+k$	$y = a(b)^{x-h}+k$
where $b > 1$	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:

Ending Amount → $y = P(1 + r)^t$

Principal or Beginning Amount

Rate as decimal

time – # usually years

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.

$y = 6191(1 + .04)^t$

b. Using your equation from part A, determine Stars Hollow population in 2001.

$2001 - 1990 = 11$

Let $t = 11$

$y = 6191(1 + .04)^{11}$

$y = 9530.8 \rightarrow 9{,}530$ peope

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:

Ending Amount → $y = P(1 - r)^t$

Principal or Beginning amount

Rate as Decimal

time - Usually # years

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.

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

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

$t = 4$

$y = 24000(1 - .16)^4$

$\boxed{y = \$11{,}948.91}$

Homework - Worksheet