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

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

p.26

Growth Function	Decay Function
$y = a(b)^{x-h}+k$	$y = a(b)^{x-h}+k$
where $b > 1$	where $0 < b < 1$

p.27

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:

$$y = P(1+r)^t$$

principal starting value

rate (as a decimal) % ÷100

time

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.

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

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

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

$t = 2001 - 1990$

$t = 11$

$y = 9530.76$

pop. $= 9{,}531$

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:

$$y = P(1 - r)^t$$

starting value

rate (as decimal)

time

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.

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

$y = 11948.9126$

Value = \$11,948.91

Homework - Worksheet Exp Growth/Decay Models - Day 1 HW

Only do #1 - 6