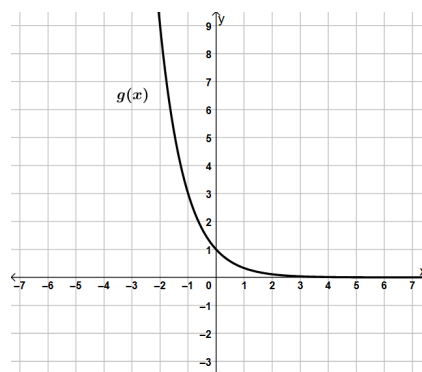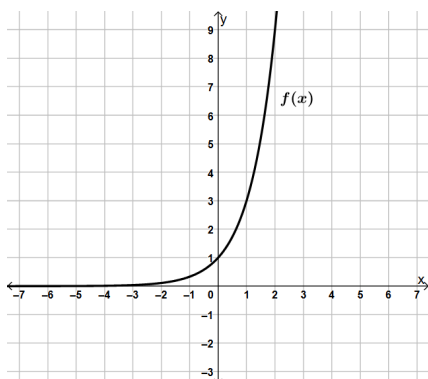# Exploring Exponential Functions

Exponential Growth and Decay

Compare the exponential functions f(x) and g(x).

The function *f(x)* shows exponential _____ because _____.

The function g(x) shows exponential _____ because_____.

The graphs show that both functions approach the x-axis, but they never actually _____ it.

This horizontal boundary line is a _____ _____.

Formula: Exponential Function

$$f(x) = a \cdot b^x$$ where $a \neq 0$, $b > 0$, and $b \neq 1$

Practice: Complete the practice problem(s) in the space below. Be sure to check your work.

Percent Rate of Change

Formula: Percent Rate of Change

$$f(x) = a(1 \pm r)^x$$

a is the initial value

r is the percent rate of change such that $0 < r < 1$

Steps to Calculate the Percent Rate of Change

Step 1:

Step 2:

Step 3:

Think Like a Mathematician: Is there another way to determine the percent rate of change? Explain.

Practice: Complete the practice problem(s) in the space below. Be sure to check your work.

Interpreting Exponential Functions in the Real World

Exponential Growth or Appreciation	**Exponential Decay or Depreciation**
The equation for exponential growth is _____ where $a \neq 0$ and $0 < r < 1$.	The equation for exponential decay is _____ where $a \neq 0$ and $0 < r < 1$.

Practice: Complete the practice problem(s) in the space below. Be sure to check your work.

Please use additional paper as needed to complete the Self-Check. You may also choose to print the lesson's Sum It Up page.