FST Name:

Problem Set 5.1 Date: Block:

***Problem Set 5.1***

**1.)** Label the following functions as exponential growth, exponential decay, or neither. List the growth/decay factor and the growth/decay rate.

$a) f\left(x\right)=3(5)^{x}$ b) $f\left(x\right)=1.9(1.07)^{x}$

$c) f\left(x\right)=15\left(0.9\right)^{x}$ d) $f\left(x\right)=\left(0.63\right)^{x}$

$d) f\left(x\right)=\frac{9}{4}\left(2.4\right)^{x}$ f) $f\left(x\right)=6500\left(1.63\right)^{x}$

**2.)** For each description of an exponential function f(x) = a(b)x, find a and b.

 a) f(0) = 3 and f(1) = 12 b) f(0) = 4 and f(2) = 1

**3.)** Make up a context or situation for which the relationship between x and y is y = 300\*(1.02)x.

**4.)**  Instead of making a down payment on a house, a couple that lives in an apartment decides to invest $50,000 that they inherited from Aunt Zelda into a real estate fund that earns 6.3% interest annual interest. Write a function that represents the value of the fund, **A**, after **t** years have passed.

**5.)** “Researchers at Cornell’s Lab or Ornithology and Canada’s National Wildlife Research Centre found in a 2019 analysis that wild bird populations in the continental U.S. and Canada have declined by 29% - or a total net loss of around three billion bird – since 1970.”

Jiang, Renee. “Bird Populations Declining Fast across North America.” *Emagazine.com*, 2 Dec. 2021, https://emagazine.com/bird-population-declines/#:~:text=Researchers%20at%20Cornell's%20Lab%20of,three%20billion%20birds%E2%80%94since%201970.

a) Approximately what was the bird population in 1970?

b) Write a function that gives the total bird population as a function of the number of years that have passed since 1970.

c) What the video at the link [3 Billion Birds Lost](https://www.youtube.com/watch?v=cdzU84AyCdI). What are some of the reasons listed for the loss in birds?

**6.)** Put the following expressions in your calculator to evaluate.

a) 10-2 b) 10-1 c) 100 d) 101 e) 102 f) 103 g) 104

**7.)** Put the following expressions in your calculator to evaluate.



Log key is here!

a) log(0.01) b) log(0.1) c) log(1) d) log(10) e) log(100) f) log(1000) g) log(10,000)

**8.)** Look at your results from questions 6 and 7. What do you notice?