

LESSON 5.2 Assignment

Name _____ Date _____

Downtown and Uptown Graphs of Exponential Functions

1. Tyler recently purchased a new car for \$55,000. He also purchased a vintage older car for \$30,000. The new car will start depreciating the minute he drives it off the lot and will decrease in value by 10% each year. Because the older car is a collector's item, it will increase in value by 5% each year.
- a. Complete the table to show the values of the cars after t years.

Time (years)	Value of New Car (dollars)	Value of Vintage Car (dollars)
t		
1		
5		
10		
20		

- b. Determine the rates of increase and decrease for the functions between 5 and 20 years. Are the rates increasing or decreasing at a constant rate? Why or why not?

- c. What is the common ratio in simplest form for the sequence each function represents?



- d. Graph both functions using a graphing calculator. Determine the y-intercepts of the functions. Explain what they mean in terms of the problem situation.
- e. Determine how long it will take the new car to depreciate to half of its original value. Explain your method.
- f. How many years from now will the value of the cars be the same? Determine the approximate values.
- g. What is the domain and range for each of the functions? What do the domain and range need to be in order to make sense of the problem?
- h. What is the equation for the asymptote of the value functions for each car? How does this relate to the problem?