Math 11 Worksheet **Name Last____________________ ___First_______________________**

Comparing Graphs for Linear and Exponential Growth: Simple and Compound Interest

SIMPLE INTEREST (Linear)

Accumulated Value at the end of year t

$$A = P + Prt = P(1+rt)$$

COMPOUND INTEREST (Exponential)

Accumulated Value at the end of year t :

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

if Annual Compounding once per year

P = Principal = Present Value = initial amount invested

A = Accumulated Value after t years   r = annual interest rate (in decimal form)

t = time elapsed since money was invested, in years.

GRAPH the values of both investments.

3. Plot some points from each of the tables.

Use a ruler to make a **straight line** for the simple interest graph.

Connect the points by a **smooth curve** for the compound interest curve.

Label which graph is simple or compound interest.

1. Suppose an investment of $10,000 is made at 6% simple interest.

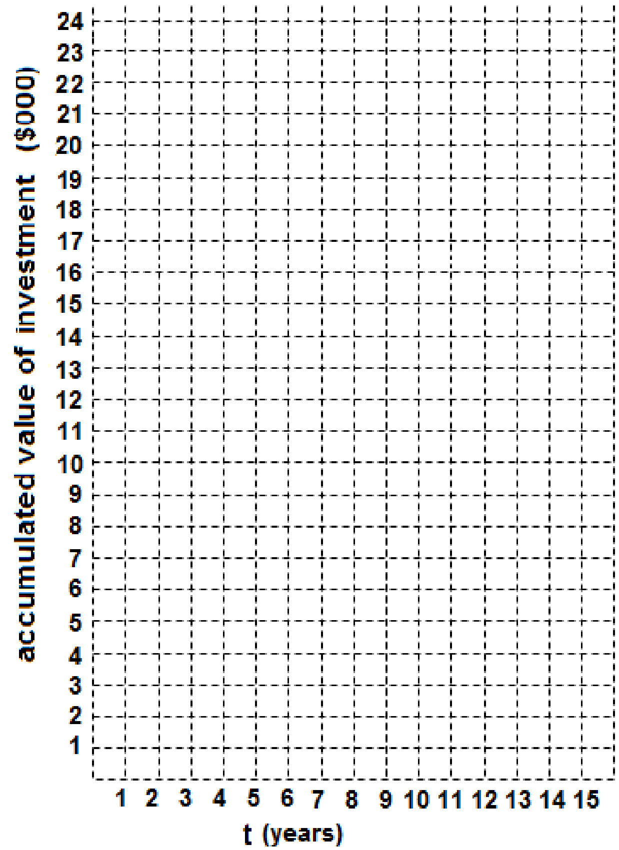
Fill out the table to show the total value at the end of the year.*(Round to the nearest dollar)*

End of year t	Accumulated Value at end of this year
0	10,000
1	
2	
3	
4	
5	
8	
10	
12	
15	

2. Suppose an investment of $10,000 is made at 6% compound interest, compounded annually

Fill out the table to show the total value at the end of the year *(Round to the nearest dollar)*

End of year t	Accumulated Value at end of this year
0	10,000
1	
2	
3	
4	
5	
8	
10	
12	
15	



4. Which investment (simple or compound interest) is better (grows more quickly) in the long run? ________________________________

Math 11 Worksheet **Name Last___________________ ___First______________________**

Comparing Graphs for Linear and Exponential Decay: Linear and Exponential Depreciation

The value of a car decreases after it is purchased. Its value is a function of its age.
Let x = the age of the car in years and V = the value of the car in thousands of dollars ($ 000)

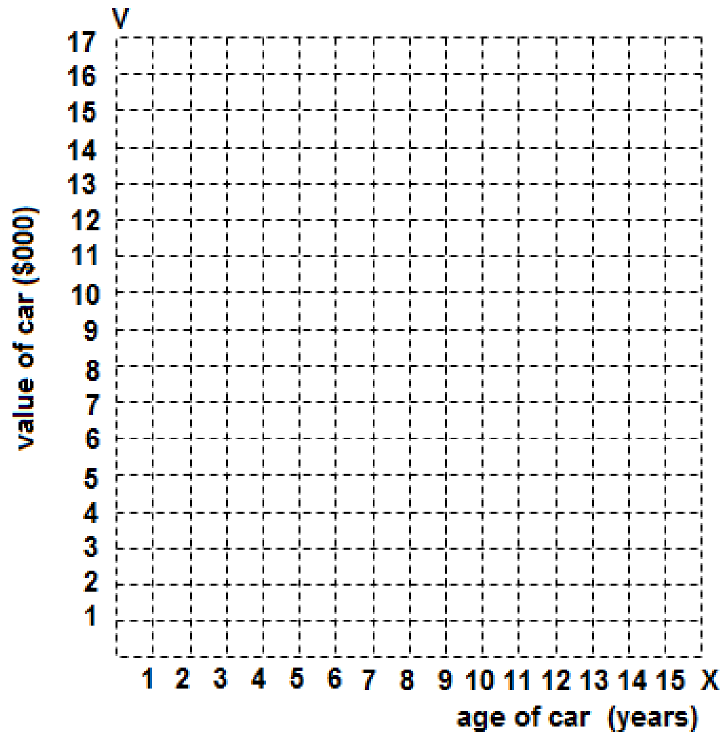
Note Place Value: If the value is $12,000 then V = 12 because value is in thousands of dollars

LINEAR depreciation model: $V = f(x) = 15 – 1.0x$

EXPONENTIAL depreciation model: $V = g(x) = 15(0.83^x)$

1. In the table show the value of the car using both methods of depreciation.
On the grid provided, accurately graph both functions and label them f and g.

Age of Car	Value ($000) Linear Depreciation	Value ($000) Exponential Depreciation
x	V = f(x)	V = g(x)
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		



2. What PERCENT of its value does the car lose each year, using <u>exponential</u> depreciation?
(Your answer should be a percent %).

3. What dollar AMOUNT of its value does the car lose each year, using <u>linear</u> depreciation?.
(Your answer should be a dollar amount).

4 a. The car's value is **decreasing faster** using the exponential depreciation model, compared to the linear model between x = _______ years and x = _______ years,.

b the car's value is **decreasing more slowly** using the exponential depreciation model, compared to the linear model between x = _______ years and x = _______ years,.

5. Does the value of the car ever exactly reach $0 using exponential depreciation? Explain.

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