

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### NUMB3RS “Identity Crisis”

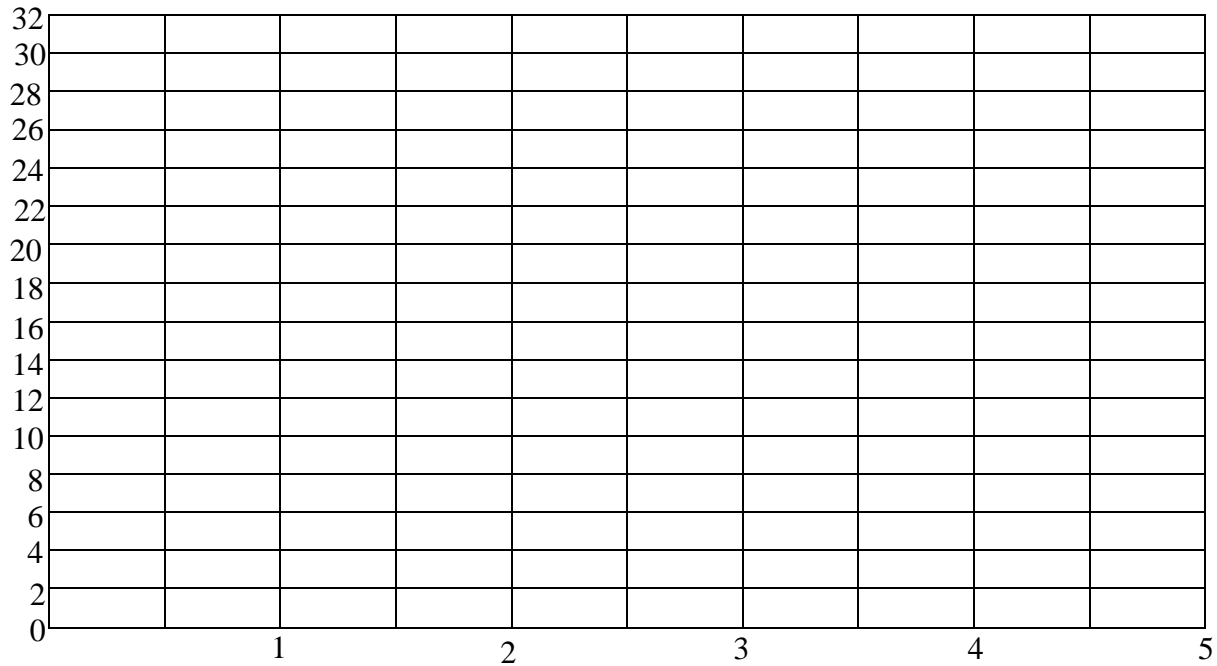
In this episode you will see the use of an exponential model in the spread of a pyramid scheme.

1. On the graph below, sketch a linear growth and an exponential growth and label which is which.



2. This episode deals with the rate at how many people can get conned into a scheme. In the episode it is based off of an exponential model. Let’s look at the difference between how fast a linear function spreads and how fast an exponential function spreads. What was the  $a_0$  in the episode?
3. From the episode what was the  $r$ ? (what was the rate of how fast it was spreading?)
4. Write the explicit rule for the exponential function in the episode
5. Now let’s assume you use the same initial amount and that instead of increasing exponentially you are increasing linearly. Using the same rate, write an explicit rule for a *linear* equation.
6. Using your functions, fill out the table below and then on the back of this paper graph the function.

x	Exponential	Linear
0		
1		
2		
3		
4		
5		



7. Which model (linear or exponential) has the most money after...
  - a. The first transaction?
  - b. The second transaction?
  - c. The third transaction?
  - d. The fourth transaction?
  - e. The fifth transaction?
  
8. Which model would you use if you were trying to siphon money from people's bank accounts? Why?
  
9. After 20 transactions, how much more money does the exponential model have over the linear model?
  
10. Why does the exponential model make so much more money than a linear model?
  
11. Give one DIFFERENT example of when an EXPONENTIAL model would be better than a linear model
  
12. Give one example of when a LINEAR model would be better than an exponential model.