Algebra 2

Chapter 7a Zombie Task

Name: Key

Date: _____ Per: _____

Zombieland Mathematics

On June 30, 2035, a sleeper cell of zombies executed an evil plan 10 years in the making. Their objective: to "turn" the entire human race into evil zombies! The zombie population **triples** by the end of each day, but they are not sure how long it will take to completely turn every human on the planet.

1) Complete the table below to track how many total zombies there are at the end of each day from Day 1 to Day 10. The original sleeper cell had 5 members.

Day	Total Number of Zombies	Day	Total Number of Zombies
0	5	6	3645
1	$5(3) = 15$	7	10935
2	$5(3)(3) = 45$	8	32805
3	$5(3)(3)(3) = 135$	9	98415
4	$5(3)(3)(3)(3) = 405$	10	295245
5	1215	x	$5(3)^x$

2) Does the Total Number of Zombies seem to increase following a linear model? Explain.

No, it is not increasing by the same # each day

3) Write an equation that models the total number of Zombies, *y*, at the end of any given day, *x*. Use the equation to complete the table above.

$y = 5(3)^x$

4) Use the equation from #3 to determine the total number of zombies after each of the following days. Show your work.

12th day:

$y = 5(3)^{12}$

2,657,205 zombies

14th day:

$y = 5(3)^{14}$

23,914,845 zombies

16th day:

$y = 5(3)^{16}$

215,233,605 zombies

5) Sketch a graph of the data for days 1-10 on the graph provided. Be sure to label your axes!

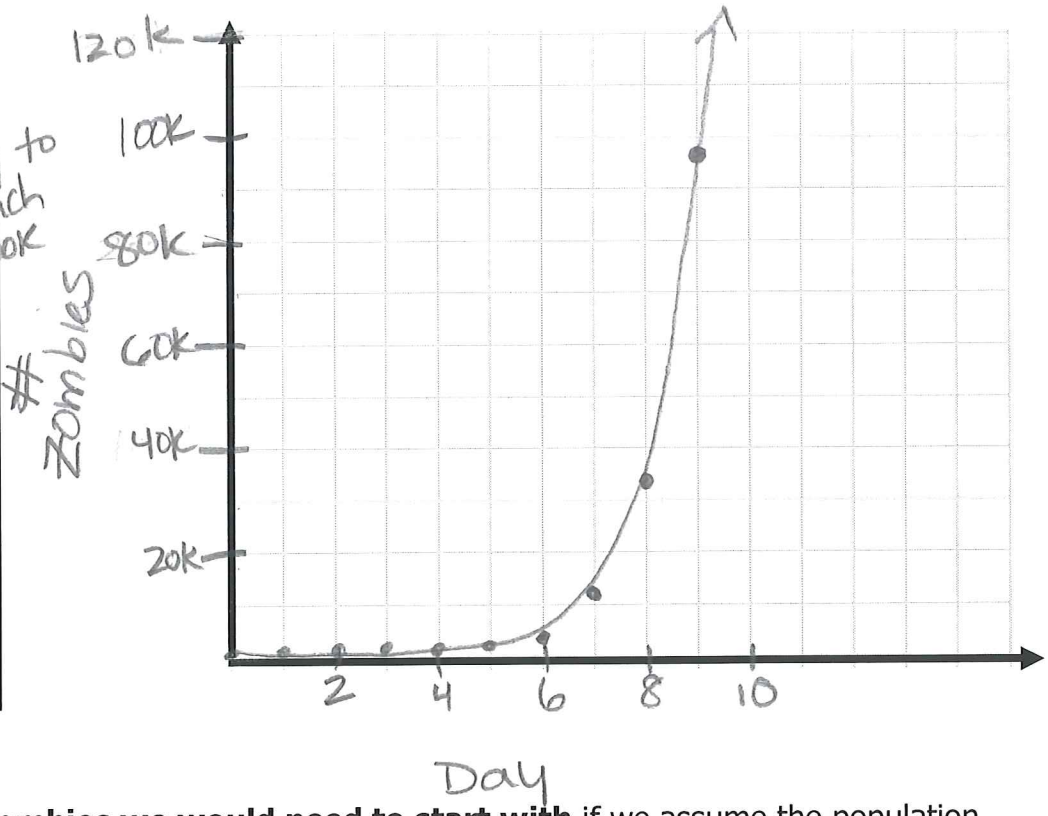
Try to reach 100K

What is the y-intercept?

(0, 5)

Does this graph appear to represent exponential growth or exponential decay? Explain.

exponential growth; # of Zombies increasing



6) Estimate the **number of zombies we would need to start with** if we assume the population of the world is 10,000,000,000 and the zombies want to take over the world in 14 days? (Hint: set up an equation)

$$\frac{10{,}000{,}000{,}000}{3^{14}} = \frac{(w)(3)^{14}}{3^{14}}$$

$w = 2090.7 \rightarrow 2091$ zombies

7) **Suppose the original sleeper cell had 25 zombies, and all other facts were the same.**

a. Write an equation for the situation described.

$y = (25)(3)^x$

b. How would the new situation affect our table values compared to the situation described of the front of the handout? How would it affect the graph?

They would be 5 times the original values. The graph would move up.

8) **Suppose the zombie population doubled by the end of each day, instead of tripled, and all other facts were the same.**

a. Write an equation for the situation described.

$y = (2)(3)^x$

b. How would the new situation affect our table values compared to the situation described of the front of the handout? How would it affect the graph?

They would by less, $\frac{2}{5}$ of the original values

The graph would move down