**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Do Vampires Exist?**

**Directions**: We are going to use math to answer the question: Do vampires exist? We will begin with the following assumptions:

* 1. **We begin with one vampire.**
	2. **We begin with our current world population of humans in 2016**
	3. **Each week, every vampire kills one human.**
	4. **Every time a human is killed, s/he turns into a vampire.**
1. Make a table, using the number of weeks as input and the total number of vampires as output. Begin with week 0.

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| --- | --- |
| Week | Total Number of Vampires |
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3. Using the table you completed for #2, find how many weeks it will take for the vampire population to be 512. Explain how you determined your answer.

4. How large will the vampire population be after 12 weeks?

5. How large will the vampire population be after 24 weeks? Explain your answer

6. On the grid, plot the number of vampires with respect to time. Be sure to label (title, x-axis, y-axis). Think in advance about how to scale your axes.



7. What is the equation that tells us how many vampires exist where v is the total number of vampires, a is the initial number of vampires, b is the ratio that shows by how much the vampires are growing? Put the equation in the form V= ***abx***

8. What is the y-intercept for this graph?

9. Using the equation, find out how many weeks it would take until the total number of vampires reaches 7,417,152,000.

10. What is significant about the number in question #9? What does this tell you about whether vampires exist?

11. Is this an accurate way to model the vampire population? What variables may exist that this model does not account for?

12. Do you think the vampire population would continue to grow exponentially like our model suggests? \_\_\_\_\_\_ What might be some limiting factors to this population growth? (Be creative!)

**The Human-Vampire Conflict Part Two: The Rest of the Story…**

**Directions**: It is week 34. All the humans have been destroyed. The world is now completely populated with vampires. The vampires have no food source. Some vampires have greater reserves of energy since they feasted upon larger, stronger humans. Others are weak. The vampires begin dying out. Each week, the vampire population is reduced by 50% or ½.

1. Create a table that tells how many vampires you have beginning with 7,417,152,000 vampires.

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| --- | --- |
| Week | Total Number of Vampires |
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1. How long would it take for the vampire population to die out completely?
2. What would be the equation for this scenario?