

Modeling Exponential Growth

For each exponential story problem, do the following:

- Write a function rule.
- Create a table of values.
- Graph the data.
- State whether the graph shows growth or decay.
- Answer the accompanying questions.

What happened to problems 3 & 4?

Did your group get to all the problems?

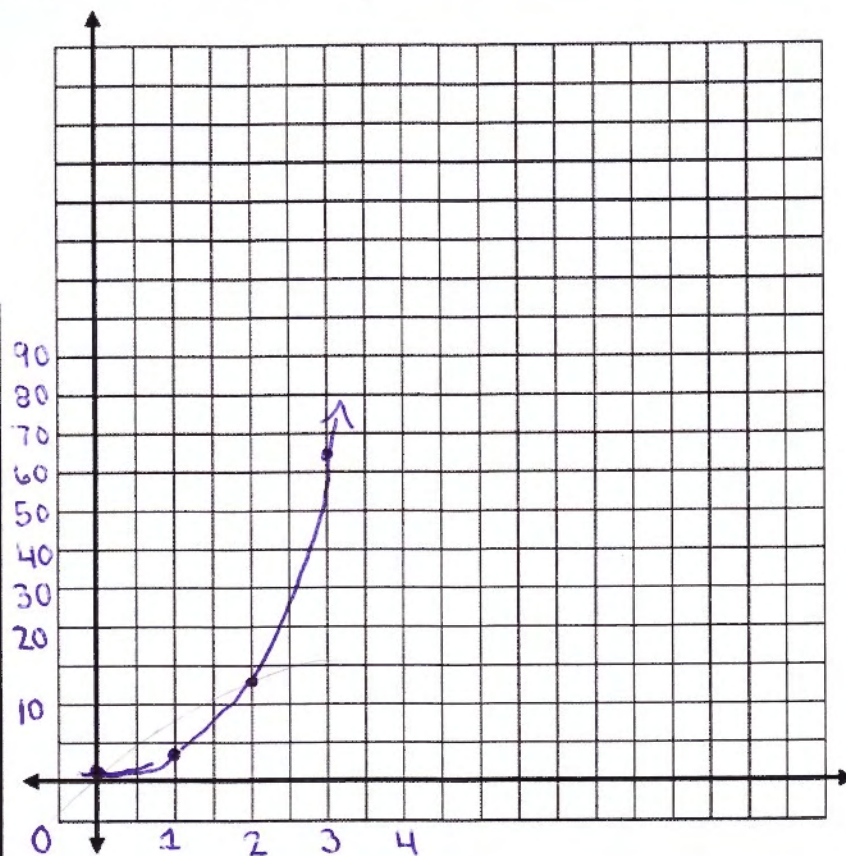
Did you need more time?

1. Zombie Apocalypse

A virus is turning people in Zombies! When the virus started spreading there was only one Zombie and the number of Zombies quadruples every week.

$$y = 1 \cdot 4^x$$

x	y
0	1
1	4
2	16
3	64
4	256



Question 1. How many Zombies will there be after 15 weeks?

$$y = 1 \cdot 4^x$$

1,073,741,824 Zombies

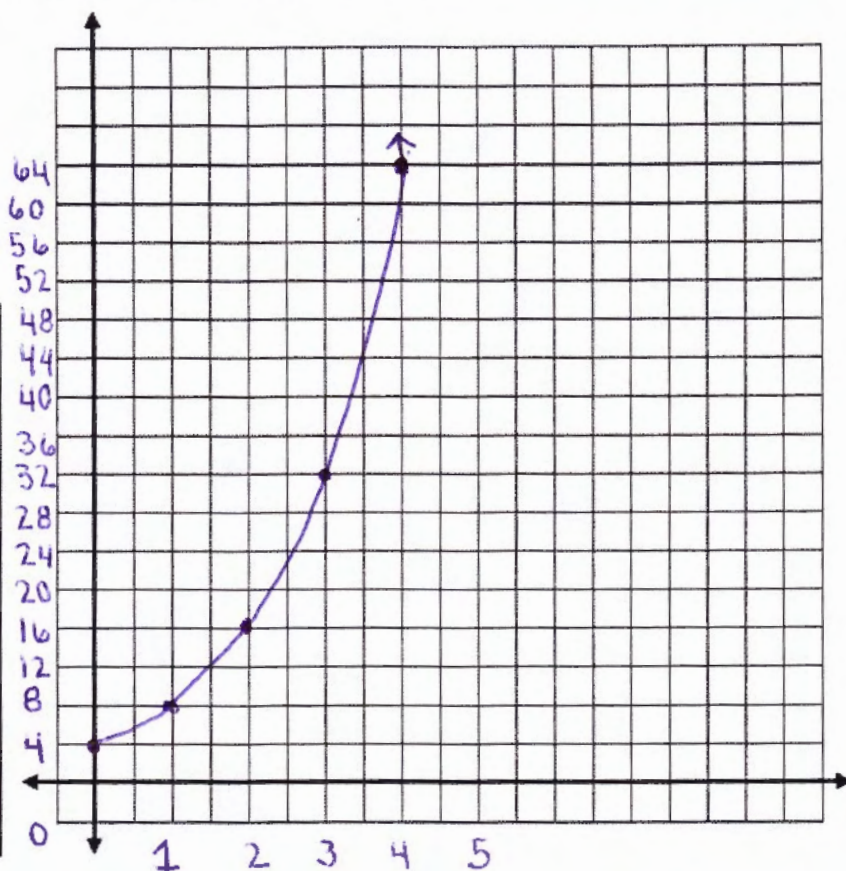
Question 2. When there are 1,000,000 people who have turned into Zombies the World Health Organization (WHO) will call the virus a pandemic. After approximately how many weeks will there be a pandemic?

4^{10} 10 weeks

✓ 2. Eagle Creek

At Eagle Creek Park there is a population of deer. When the deer first moved into Eagle Creek there were 4 deer and the number of deer doubles each month.

x	y
0	4
1	8
2	16
3	32
4	64



Function rule: $y = 4 \times 2^x$

Question 1. How many deer will there be after 10 months?

4096

Please write $y = 4 \cdot 2^x$ otherwise it looks like $y = 4x \cdot 2^x$.

Question 2. When there are more than 10,000 deer, Eagle Creek will have to move the deer to other parks in the state. After approximately how many months will deer have to be moved?

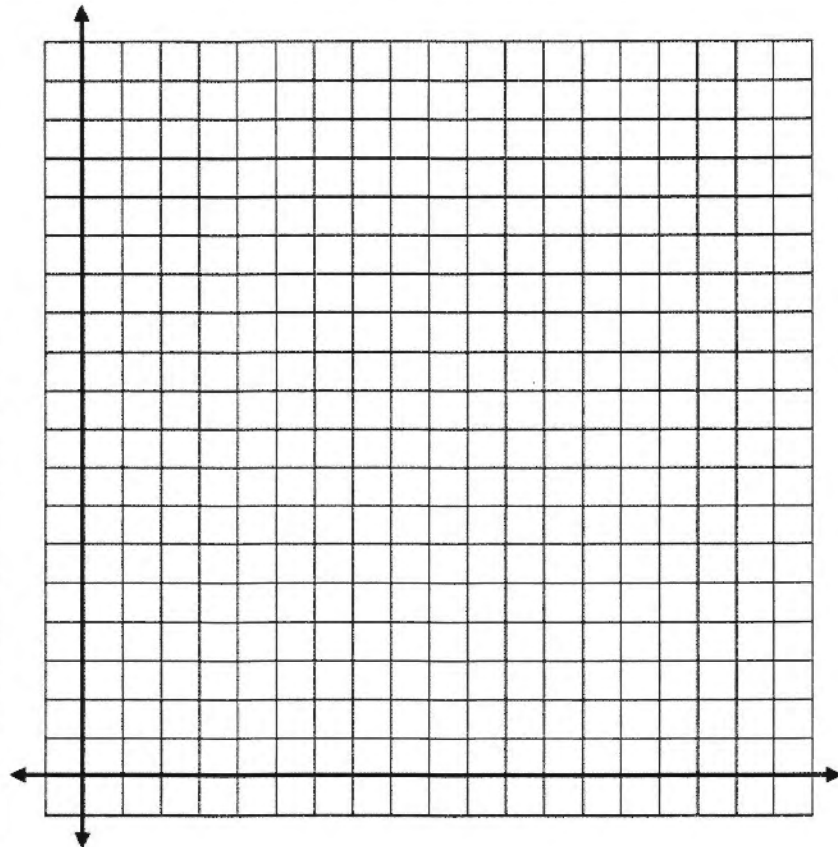
12 months

How did you get this?

3. Guitar Club Membership

Mrs. Petrin is the sponsor for Guitar Club at Pike. During the first week of school she had 2 people join Guitar Club. The number of people joining Guitar Club doubles each week.

x	y



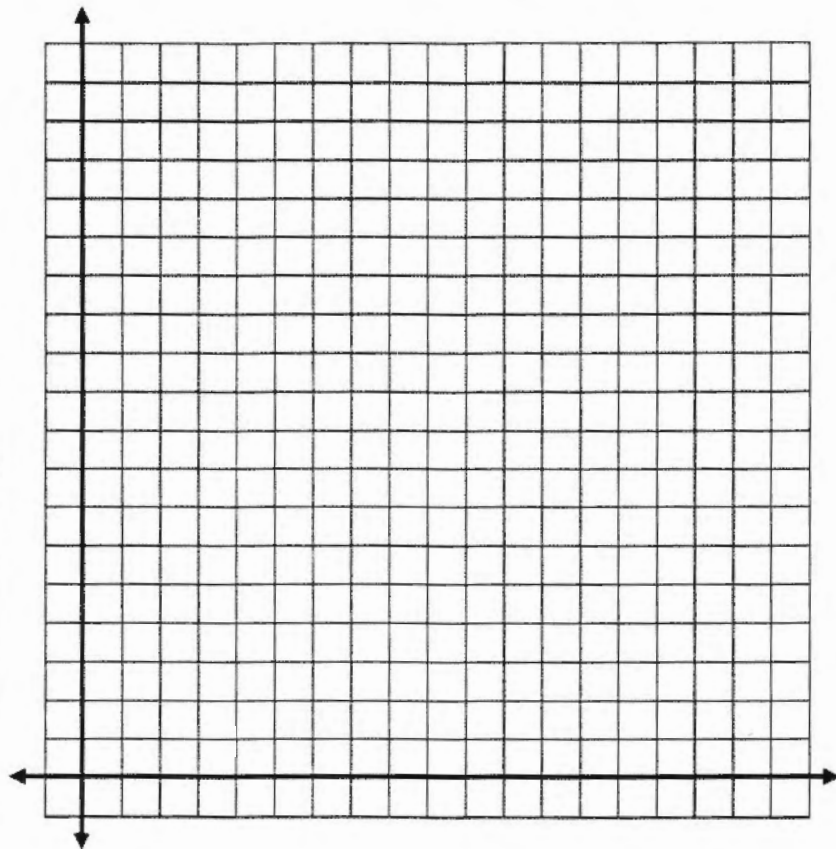
Question 1. How many students are in Guitar Club after 4 weeks?

Question 2. Once Mrs. Petrin has more than 30 students join Guitar Club, she has to get a bigger room for them to use. After approximately how many weeks will Mrs. Petrin have to get a bigger room?

4. Sick Day

Ms. Wraley came to Pike sick one day and got 3 students sick. The next day the sick students came to school and got other people sick. The number of students who get sick triples every day.

x	y



Question 1. How many students will be sick after 6 days?

Question 2. After half of the students at Pike (1,630 students) are sick, Mr. Inman has to cancel school. After approximately how many days will school have to be cancelled?