Student 1 Work Sample Name: [redacted] Period: 3 Date: 2/5/16

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.

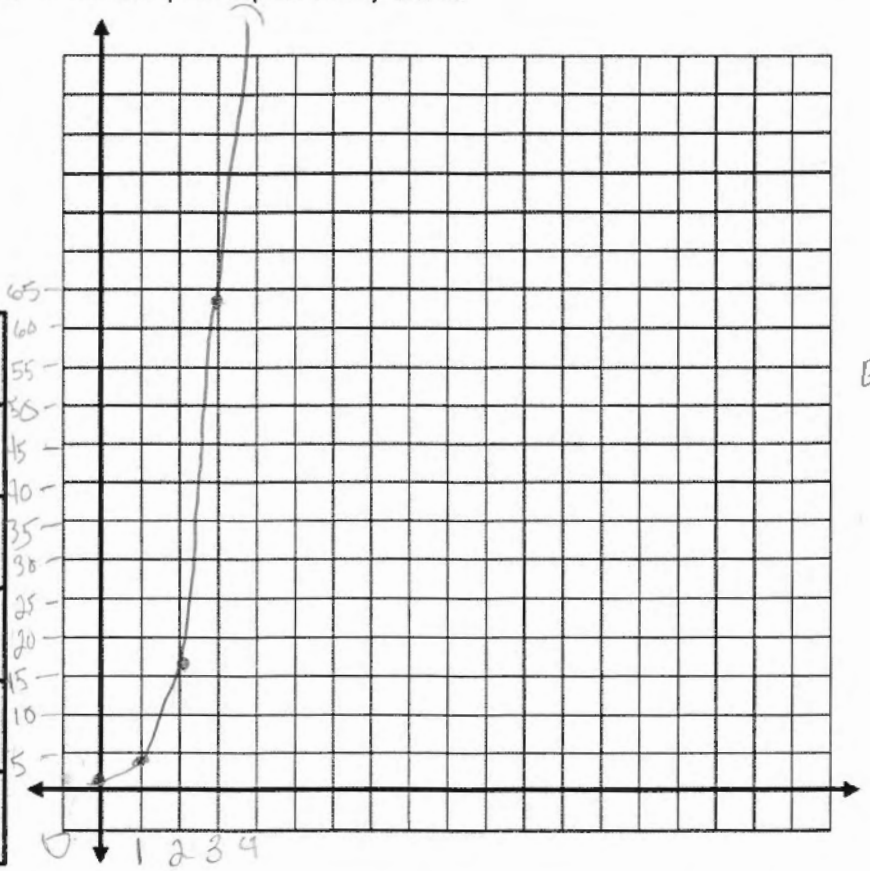
Good work!
Where are your units?

1. Zombie Apocalypse [redacted]

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



Expentian

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

$1,073,741,824$ $1 \cdot 4^{15}$

units?

1,073,741,824

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?

$65,536^4$

$262,144^a$

1,000,000

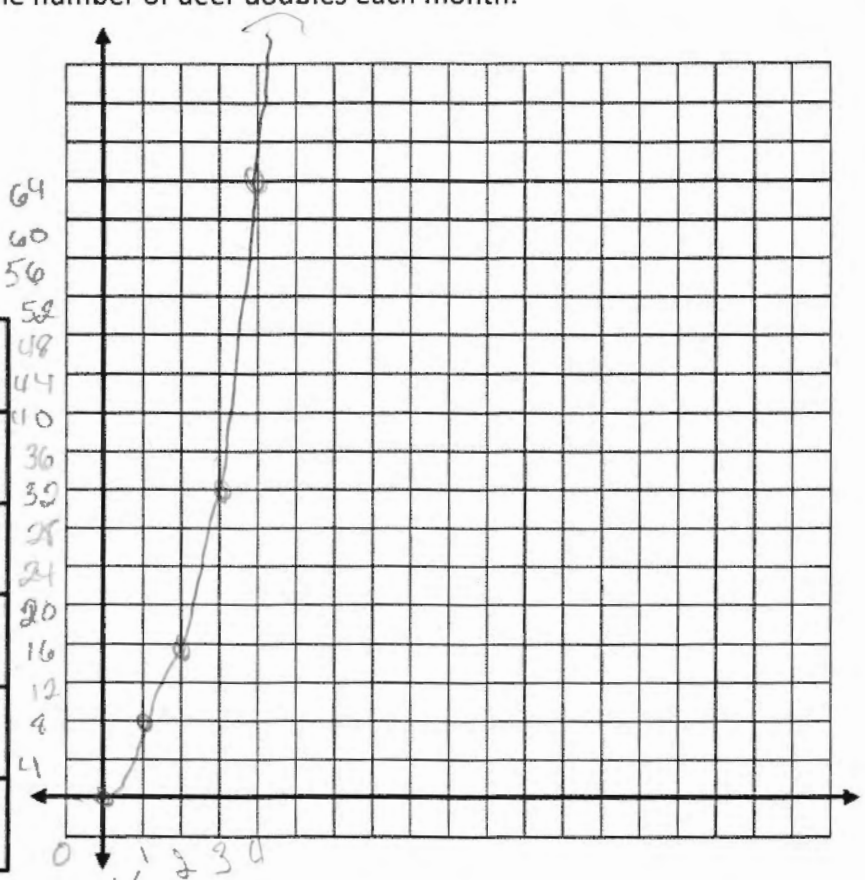
between 8 & 9 weeks

use guess & check to determine what x makes $1{,}000{,}000 < 1.4^x$ true.

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?

4,096

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?

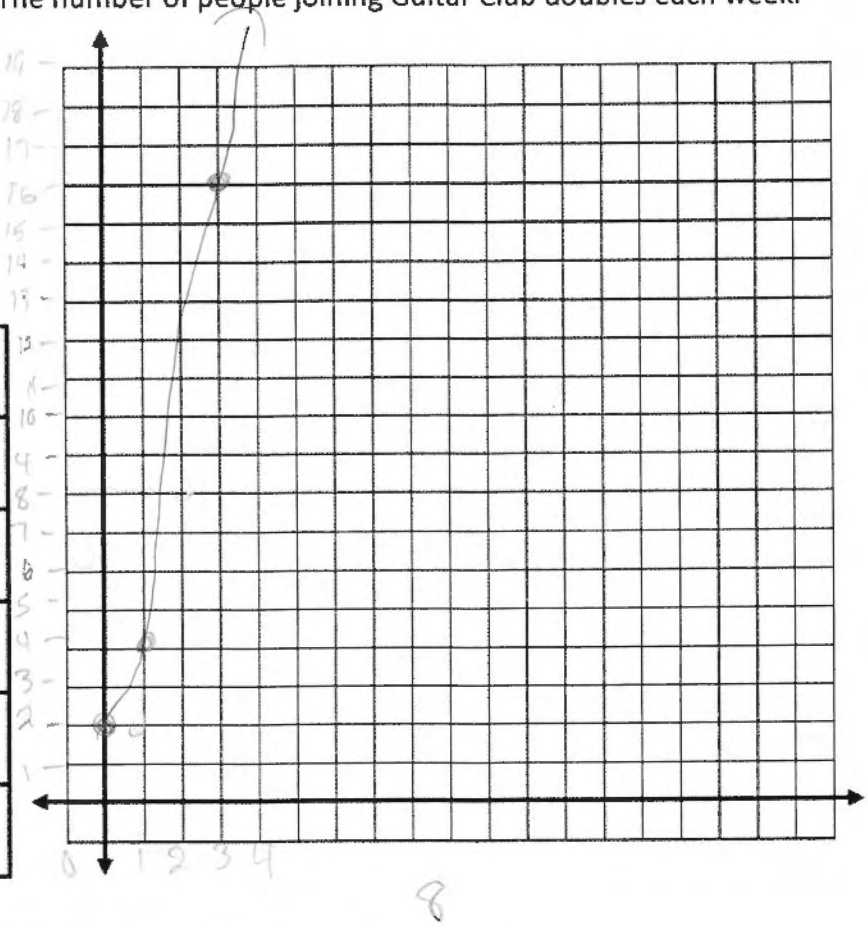
?

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.

$y = 2 \cdot 2^x$

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



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

After 8

512

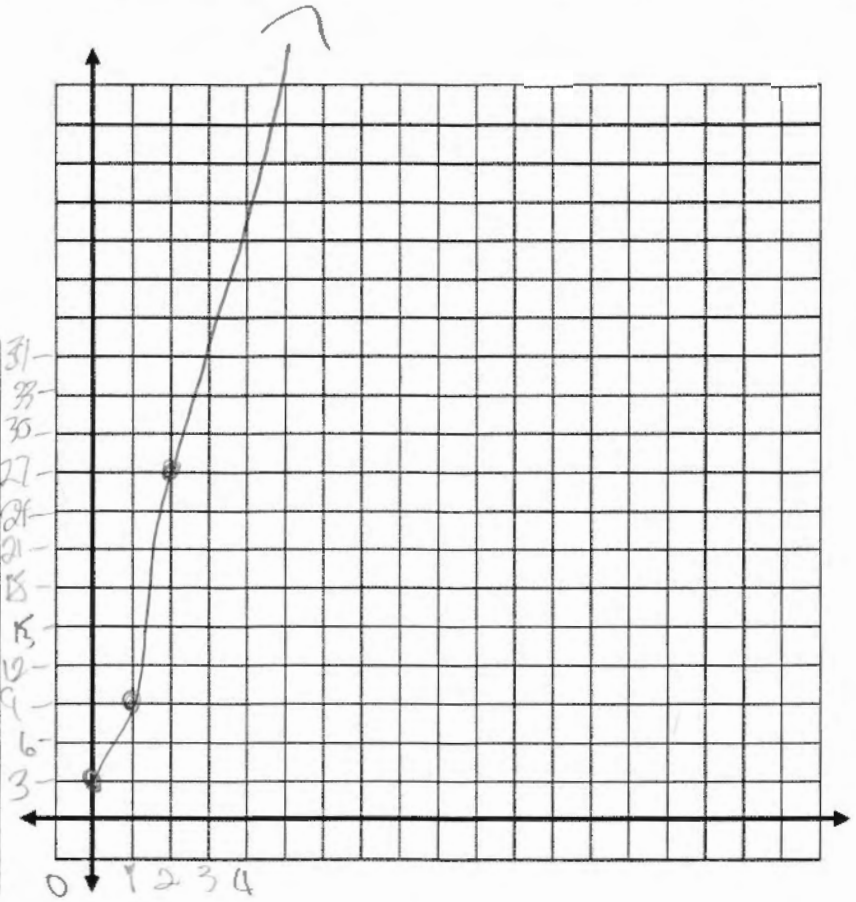
Question 2. Once Mrs. Petrin has more than 30 students join Guitar Club, she has to get a bigger room for them to use. After approximately how many weeks will Mrs. Petrin have to get a bigger room?

5 weeks

4. Sick Day

Ms. [redacted] came to [redacted] 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
0	3
1	9
2	27
3	81
4	243



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

2,187

units?

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?

7 days