

LESSON **5.6** Assignment

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

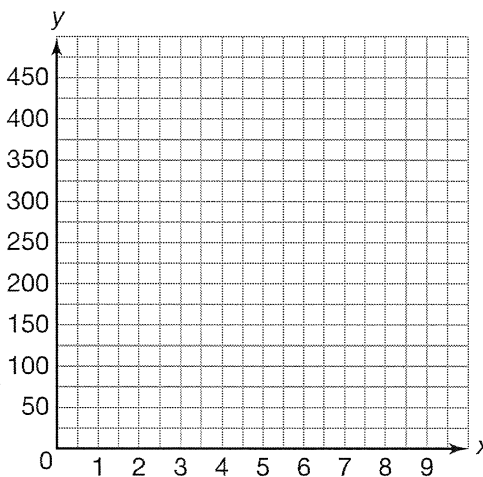
**Checkmate!**  
**Solving Exponential Functions**

Roberto and Maeko open a pet store. They sell fish, birds, and small mammals.

1. Roberto and Maeko start with 5 hamsters for sale. Hamster populations usually triple every cycle. One cycle is equal to 4 months. Determine the number of hamsters they will have after each cycle.

Cycle	Number of Hamsters
0	5
1	
2	
3	
4	
5	

- a. Graph the points from your table.



5

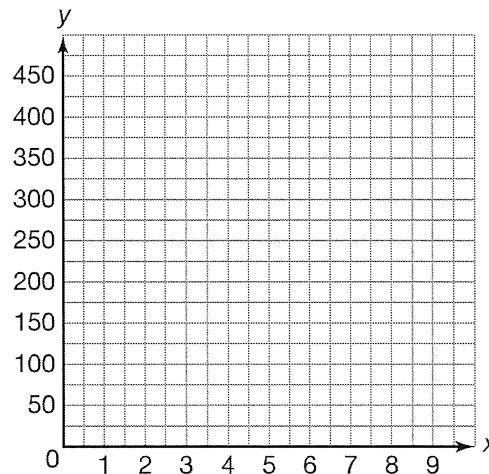
- b. Does it make sense to connect the points in this graph? Why or why not?
- c. Write an equation in function notation to represent the change in the number of hamsters as a function of the cycle number,  $c$ . Explain how you determined your equation.
- d. Determine the cycle at which there will be 32,805 hamsters. In how many months will this be? Explain how you determined your answer.
- e. After how many cycles will there be at least 98,000 hamsters? In how many months will this be? Explain how you determined your answer.
- 5**
- f. Robert and Maeko are overwhelmed by hamsters. They counted the hamsters and now have 10,935 of them. What cycle has just completed? Show your work.

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

2. Robert and Maeko have 20 large tanks of fish in their store. They notice that one of the larger tanks is losing water, but they can't find the leak. The tank started with 450 gallons of water, but appears to be leaking two-thirds of its water each hour. This means that after the first hour the tank has one-third of the water left, or 150 gallons. Complete the table to show the amount of water the tank will have after each hour. Write each amount as a whole number, mixed number, or fraction.

Hour	Amount of Water (gallons)
0	450
1	
2	
3	
4	
5	

- a. Graph the points from your table.



b. Does it make sense to connect the points in this graph? Why or why not?

c. Write an equation in function notation to represent the gallons of water in the tank after any hour,  $t$ . Write the function in two ways: one with a positive exponent and the other with a negative exponent. Explain how you determined your answers.