**KILROY ACADEMY**

NAME: _____ DATE: _____

A FUZZY FAIRY TALE

Complete the following worksheet after watching *A Fuzzy Fairy Tale*

1. The Princess finds a magical teddy bear that promises, "To turn into two tomorrow," if it is given a good home.
    a. What component of the exponential growth function, $y = ab^x$, would 2 represent?

    b. Explain how you know?

    c. Write the exponential function that represents the teddy bear's reproduction.

    d. Explain the importance of "a"

2. Complete the table of values that shows the teddy bear's reproduction over the course of 5 days.

$x \, (days)$	0	1	2	3	4	5
$y \, (teddy \, bears)$						

3. Graph and label the key features of the exponential function below. Use appropriate scales. Include a minimum of 3 points and graph the function's asymptote.
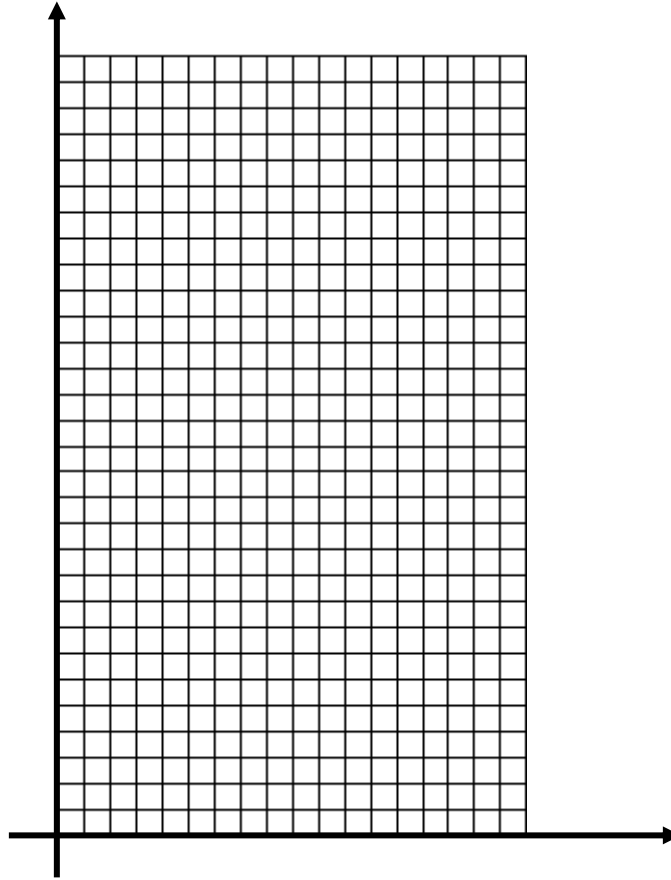
4. On the same coordinate plane, graph the inverse of the exponential function. Be sure to label the graph with its key features and include the line of reflection/symmetry.

5. Write the equation for the inverse function.

6. In three days, the box is one-quarter full.
   a. How many more days will it take for the box to be full?

   b. How many total days did it take to fill the box?

7. Suppose the teddy bears were much smaller and the box that the princess found was much bigger so it took 4 weeks (28 days) for the box to become one quarter full.
    a. How many days would it take until this box was full?

EXTENSION TO HUMAN POPULATION GROWTH

8. The following table shows the estimated population of humans on Earth over time.

Year	8000 B.C.	1 A.D.	1600	1800	1930	1959	1974	1987	1999	2011
Estimated population of humans on Earth	5 million	200 million	500 million	1 billion	2 billion	3 billion	4 billion	5 billion	6 billion	7 billion

a. Create a graph of the data.
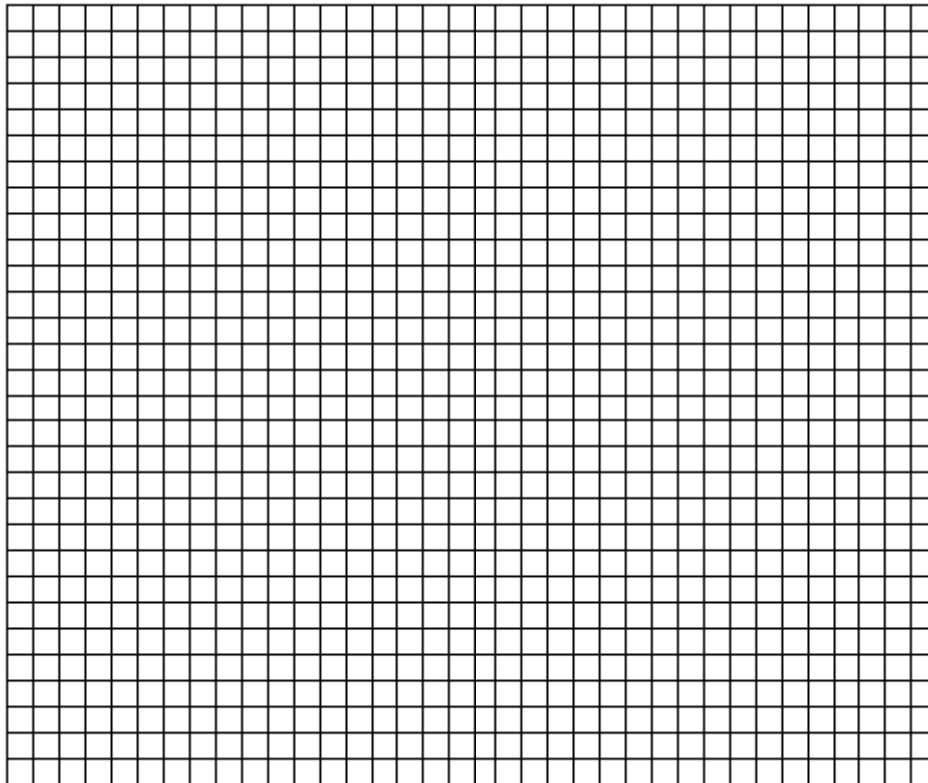
b. Add to this graph the historical world population estimate when your mother (or father) was born, when you were born, and today.

ACKNOWLEDGEMENTS