## **Exponential Growth and Decay Investigation**

## Part I - Folding Paper Activity

This is an easy activity which illustrates both exponential growth and decay.

- Fold a sheet of paper in half as many times as possible.
   After each fold, record three columns of information in a chart as illustrated below.

Number of Folds (n)	Number of Regions Formed on the Paper (R)	Area of Each Region Relative to the Whole Sheet of Paper (A)		
1	2	1/2 (The area of each region is half the area of the whole sheet.)		
2	4			
3				
4				
5				
6				

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If n represents the number of folds, develop a formula for finding R, the number of regions formed on the

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Use these formulas to extend the chart to include information on more folds than are physically possible. Make two graphs of the information; one with the number of regions on the y-axis and the number of folds on the x-axis and, the other with the area of region on the y-axis and the number of folds on the

Answer the following questions
a) How are the two graphs similar? different?

- c) Which of the two graphs represents an exponential growth? an exponential decay?
- d) While the graph of area versus number of folds is constantly decreasing, why will it never reach the