

Regression Models: Activity C

How Far Can You See?

(Source: Murdock, J., Kamischke, Ellen and Eric. *Advanced Algebra Through Data Exploration*. Key Curriculum Press. 1998. Pg 368, Problem 7.)

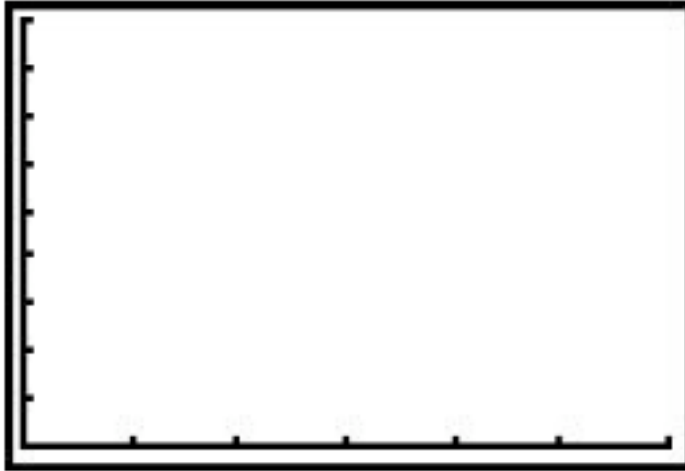
In clear weather, the distance you can see from a window on a plane depends on the curvature of the earth and your height above the earth.

The following table gives the plane's height (in meters) above earth and your viewing distance (in km).

Height (m)	Viewing Distance (km)
305	62
610	88
914	108
1524	139
3048	197
4572	241
6096	278
7620	311
9144	340
10668	368
12192	393

1. What is a reasonable domain for this situation?
2. Use your graphing utility to make a scatter plot of the data. Record your graph on the grid below. What does the plot tell you about this situation?

Suggested window: $[0,13000]$ by $[0,500]$ Xscl = 500, Yscl = 20



3. What mathematical models might be used to describe this data? Why?
4. Use the regression capabilities of your graphing utility to fit each of the following models to the data. Which is the better model? How do you know?
 - A. Natural Log Regression Model
 - B. Power Regression Model
5. Use the two models in #4 to estimate the plane's height for the viewing distance to be at least 450 km. Describe how you do this with technology. Also, do this **mathematically** for both models.