**Activity 5.5.5 Which Model Should I Use?**

The Radicati Group is a technology market research firm. Since 1993, they have gathered and analyzed data related email, social networks, instant messaging, and more. Since 2009, they have been publishing the number of active email accounts worldwide.

|  |  |
| --- | --- |
| **Year** | **Number of Active Email Addresses (Worldwide)**  **in Millions** |
| 2009 | 2,192 |
| 2010 | 2,926 |
| 2011 | 3146 |
| 2012 | 3,375 |
| 2013 | 3,899 |
| 2014 | 4,116 |
| 2015 | 4,353 |

As you can see in the table, the number of email addresses has been growing steadily since 2009. Has the growth been linear, logarithmic, exponential, or based on a power function? To determine the type of growth, start by graphing the data.

1. **Linear Model**

Graph the data. Using technology, write a linear model for the data. Graph the linear model.

What is the correlation coefficient?

Explain whether or not the linear model is appropriate for this data.

1. **Logarithmic Model**

Using technology, write a logarithmic function to model the data. Graph the logarithmic model.

What is the correlation coefficient?

Explain whether or not the logarithmic model is appropriate for this data.

1. **Power Function Model**

Using technology, write a power function to fit the data. Graph the power function.

What is the correlation coefficient?

Explain whether or not a power function is a good model for this data.

1. **Exponential Model**

Using technology, write an exponential function to model this data. Graph the exponential function.

What is the correlation coefficient?

Explain whether or not the exponential function is appropriate for modeling this situation.

1. **Which Model is Best?**

Of the four models that you created, which is the best model for representing this situation? Explain which model you choose and why. Make sure that your explanation includes mathematical reasons and also contextual reasons based on the situation (the number of active email addresses worldwide).