**Activity 4.2.3 – Pace vs. Speed on a Treadmill**

*Pace* and *speed* both describe how fast an object is moving. Runners generally use pace to describe the rate of their movement by the number of minutes it takes to cover a mile. Cyclists generally use speed; speed is the measure of how fast an object is moving. Speed applies to all moving objects such as bicycles, cars, buses, trains, and airplanes. One unit of speed is miles per hour. For example, if you are running and take 15 minutes to complete a mile, your pace is 15 minutes per mile, while your speed is 4 miles per hour.

The table to the right shows the relationship between a person’s pace (number of minutes per mile) and their speed (in miles per hour) on a treadmill.

|  |  |
| --- | --- |
| **Pace****(minutes per mile)** | **Speed****(miles per hour)** |
| 20:00 | 3.0 |
| 17:39 | 3.4 |
| 15:47 | 3.8 |
| 13:38 | 4.4 |
| 12:00 | 5 |
| 10:43 | 5.6 |
| 9:41 | 6.2 |
| 8:49 | 6.8 |
| 8:20 | 7.2 |
| 7:54 | 7.6 |
| 7:30 | 8.0 |
| 6:59 | 8.6 |
| 6:15 | 9.6 |

We will use statistical regression to create a power function to describe this relationship. Follow the steps below.

* Press the STAT key, select 1:edit, and enter the data into lists

L1 and L2

* Press STAT PLOT to create a scatterplot of the data. Be sure to set an appropriate window.
* Press the STAT key, go to the CALC menu, and select A:PwrReg for Power Regression.
1. Write the power function that models these data?
2. Sketch a graph of the function. Label the axes.

