Name: _____ Date: _____ **Unit 3 Class Work**

Designing a Linear Model Class Work

Objective: You will be able to design, compare, and make suggestions for linear models of real life situations.

★ **Think-Write-Pair-Share**: Complete all work on a separate sheet of paper.

1. *What ideas do you have regarding the given situation?*

An athletic shoe company is designing a new running shoe. The sole of the shoe is designed with 5.0 millimeters of tread on the heel area and 4.0 millimeters of tread on the front-foot area.

To test the durability of the shoe, the designers gave test shoes to 9 people who run every day. After one week of use, the tread was measured to see how much was remaining. The results of the test are shown in the table.

Tread Remaining after One Week

Runner	Tread Thickness - Heel (millimeters)	Tread Thickness - Front-Foot (millimeters)
A	4.83	3.90
B	4.84	3.91
C	4.79	3.86
D	4.82	3.87
E	4.80	3.87
F	4.76	3.84
G	4.79	3.86
H	4.77	3.85
I	4.82	3.88

2. *Assume you were asked to create one model for the tread thickness of the heel and one model for the tread thickness of the front-foot that could be used to determine the time the tread of the shoes will last under daily use. How many models do you need to create? What types of functions would your models be? Describe how you can determine your models, and state any assumptions you make in doing so.*

3. *Use your models from Part 2 to determine the number of weeks the shoe is expected to last.*

4. *Based on your models from Part 2, describe how the company could modify the thickness of the tread so that the tread on the entire shoe lasts about the same amount of time. Justify your description.*