Name:

Date:

School:

Facilitator:

3.06 Non-Linear Problem-Solving (30 Points)

**Answer the questions using GeoGebra, Excel or a graphing calculator.**

The success of a shopping center can be represented as a function of the distance (in miles) from the center of the population and the number of clients (in hundreds of people) who will visit. The data is given below.

|  |  |
| --- | --- |
|  **Number of Customers****(in hundreds)** | **Distance****(in miles)** |
| 8 | 15 |
| 7 | 19 |
| 6 | 25 |
| 4 | 23 |
| 2 | 34 |
| 1 | 40 |

1. Drag the points to create a scatterplot for this data.

|  |
| --- |
| *Insert your graph below:* |
|  |

1. Using GeoGebra, determine the regression equation: *y* =       *x* +
2. To receive 300 customers (*x* = 3), what distance from the center of the population should the shopping center be located. Show your work.

|  |
| --- |
| *Write your response below:* |
|  |

1. To receive 500 customers (*x* = 5), what distance from the center of the population should the shopping center be located. Show your work.

|  |
| --- |
| *Write your response below:* |
|  |

1. Is this an example of positive, negative, or exponential correlation?
2. You are the manager for a factory and have collected data on employee performance in making your product over a 10-day period. **Use GeoGebra or Excel to graph the data and produce a line/curve of best fit. Place a copy of the graph in the response box.**

|  |  |
| --- | --- |
| Hours Worked | Pieces Produced |
| 43 | 255 |
| 43 | 256 |
| 44 | 263 |
| 35 | 211 |
| 36 | 218 |
| 44 | 265 |
| 41 | 247 |
| 45 | 273 |
| 36 | 221 |
| 41 | 241 |

|  |
| --- |
| *Copy of graph below:* |
|  |

1. What is the equation for the line/curve of best fit?
2. Predict how many pieces a worker will produce if they work 30 hours.

**Answer the following questions by creating an equation that will allow you to calculate an answer.**

1. The chart below displays units sold at various times per year. Using the values, estimate how many units will be sold in month 15.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month** | 1 | 4 | 7 | 10 | 13 |
| **Units Sold** | 1082 | 1680 | 2662 | 3783 | 6430 |

1. The chart below is data collected illustrating the length of water lines and the pounds of pressure that runs through each line. What would be the amount of pressure for a water line that was 55 feet long? (Round up to the nearest pound. 99)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Water Line Length in feet** | 30 | 40 | 51 | 60 | 70 |
| **Pressure in pounds** | 300 | 180 | 102 | 51 | 25 |