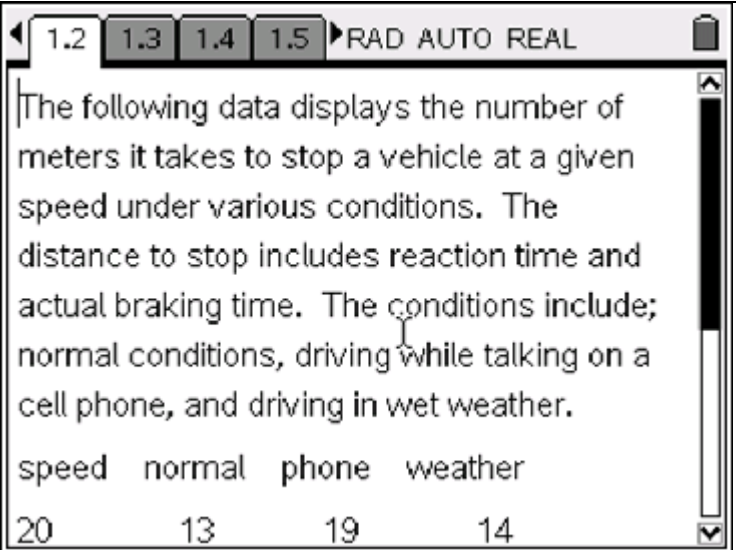
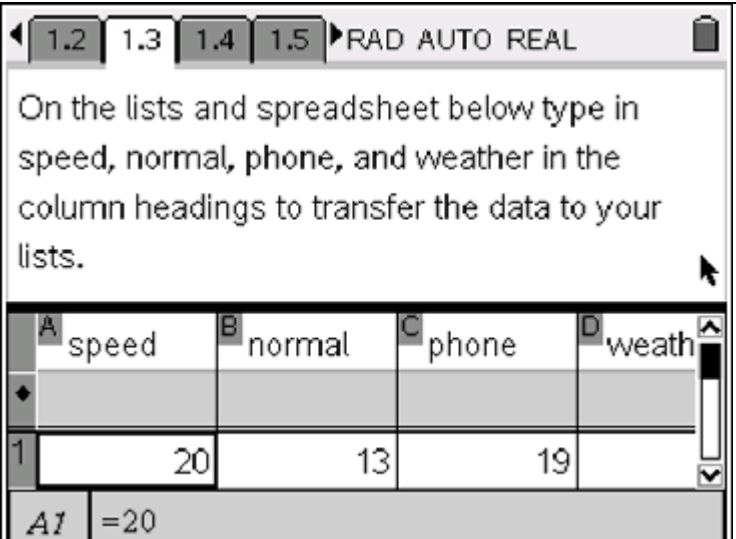


Braking Distance
 Algebra I or Algebra II
 Time: 30 minutes
 Leslie Mattern
 Sevier County High School

SPI 3103.5.3 Analyze patterns in a scatter-plot and describe relationships in both linear and non-linear data.

| <p>The data for braking distances was collected from www.ask.com/stoppingdistances. The data takes into consideration both thinking time and braking time for stopping at various speeds and various conditions. The conditions are normal, driving while talking on a cell phone, and driving in wet weather.</p> |  <p>The following data displays the number of meters it takes to stop a vehicle at a given speed under various conditions. The distance to stop includes reaction time and actual braking time. The conditions include; normal conditions, driving while talking on a cell phone, and driving in wet weather.</p> <table border="1"> <thead> <tr> <th>speed</th> <th>normal</th> <th>phone</th> <th>weather</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>13</td> <td>19</td> <td>14</td> </tr> </tbody> </table> | speed | normal | phone | weather | 20 | 13 | 19 | 14 | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------|-------|---------|-------|--------|-------|-------|----|----|----|--|
| speed | normal | phone | weather | | | | | | | | | | |
| 20 | 13 | 19 | 14 | | | | | | | | | | |
| <p>Students should type in speed, normal, phone, and weather into the column headings and the data will be transferred for them into the spreadsheet.</p> |  <p>On the lists and spreadsheet below type in speed, normal, phone, and weather in the column headings to transfer the data to your lists.</p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <tr> <th>speed</th> <th>normal</th> <th>phone</th> <th>weath</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>13</td> <td>19</td> <td></td> </tr> </tbody> </table> <p>A1 =20</p> | A | B | C | D | speed | normal | phone | weath | 20 | 13 | 19 | |
| A | B | C | D | | | | | | | | | | |
| speed | normal | phone | weath | | | | | | | | | | |
| 20 | 13 | 19 | | | | | | | | | | | |

The students should find the model of best fit and the stat calculations for each set of data for the 3 driving conditions. I have them find the stat calculations on a calculator page so they can then make predictions with their formulas.

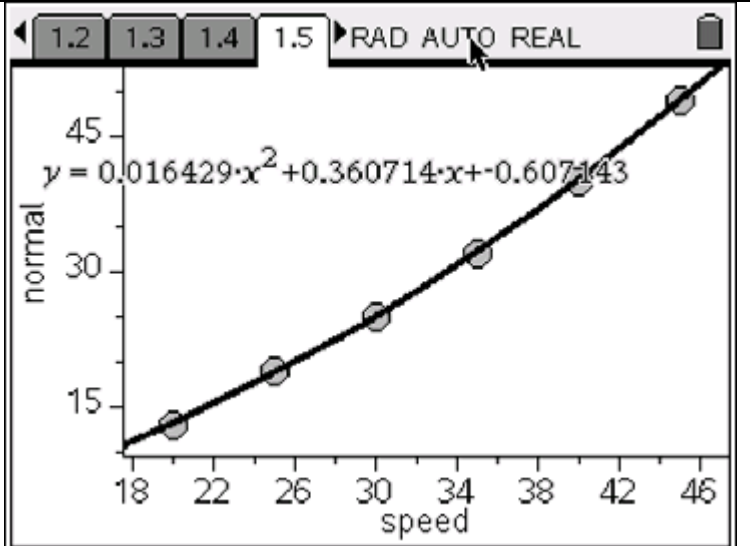
1.2 1.3 1.4 1.5 RAD AUTO REAL

On the following data and statistics page find the model of best fit for each function.

1. speed versus normal conditions
2. speed versus phone
3. speed versus wet weather

Record your equation on your paper rounding values to the nearest thousandths position.
After you have found your regression formula

The screen shot shows the regression formula for speed versus normal conditions. They should find the model of best fit. At this point we have discussed linear, exponential, and quadratic functions. They should find this data for all 3 driving conditions.



After finding their stat calculations for each set of data, they are asked to find the distance it would take to stop when traveling 55, 65, and 75 miles per hour.

1.3 1.4 1.5 1.6 RAD AUTO REAL

| | |
|-------------------|---------------|
| "RegEqn" | "a*x^2+b*x+c" |
| "a" | 0.016429 |
| "b" | 0.360714 |
| "c" | -0.607143 |
| "R ² " | 0.999801 |
| "Resid" | "{...}" |

f1(55) 68.9286

2/99

On the following 3 pages the students will be given a graph for each set of driving conditions. As they move the vertical line with the open circle not only will the speed change but the screen will tell them what would have likely occurred to a pedestrian for those conditions.

1.7 1.8 1.9 2.1 RAD AUTO REAL

On the following 3 pages you will find the statistics of what would happen to a pedestrian if your car had collided with them under the conditions we've looked at. Move the point that has an open circle to discover what happens.

The students should record for each driving condition inequalities that display the speed intervals and the consequences to the pedestrian.

