**NON-LINEAR**

An experiment is conducted to determine the relationship between initial speed and stopping distance of automobiles. A sample of twelve cars is tested and the following data are recorded:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Initial speed in mph (x) | 20 | 20 | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| Stopping distance in ft (y) | 15.9 | 24 | 41.2 | 58.7 | 74.8 | 88.8 | 112.6 | 127.6 | 216.4 | 200 | 276.8 | 301 |

1.       Draw the scatterplot of this data. Observe that the shape is not linear. How can you best describe the shape?

2.       Create a new set of data using the transformation y' = sqrt(y). In other in the above table keep the x values the same and replace the y values by y' values.

3.       Draw a scatterplot of this data. What can you say about the shape of this scatterplot?

4.       Find the linear equation that best describes the relationship between x and y'

5.       Replace the y' in this equation by sqrt(y) and solve the resulting equation for y.

6.       Write a brief conclusion.

1. $log\_{7}17=$
2. $1.154$
3. $1.271$
4. $1.343$
5. $1.456$
6. $1.653$
7. The most simplified form of

$$log\_{a}\sqrt[3]{\frac{a^{2}b^{2}}{c^{4}}}$$

is

1. $\frac{2}{3}+\frac{2}{3}log\_{a}b-\frac{4}{3}log\_{a}c$
2. $\frac{1}{3}-\frac{2}{3}log\_{a}b-\frac{4}{3}log\_{a}c$
3. $\frac{1}{3}-\frac{4}{3}log\_{a}b+\frac{2}{3}log\_{a}c$
4. $\frac{2}{3}+\frac{2}{3}log\_{a}b+log\_{a}c$
5. None of the above.
6. If

$$3^{log\_{3}6}=2x$$

then $x=$

1. $6$
2. 3
3. 9
4. -1
5. None of the above.