The U.S. Bureau of Public Roads determined the following characteristic total stopping distances D depending on the velocity of cars.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Speed M.P.H. (*v*) | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| Total Stop Distance D (ft) | 42 | 73.5 | 116 | 173 | 248 | 343 | 464 |

**a)** Determine the best way to model the data. For example, by: a power function, an exponential function, or a polynomial. You may find it helpful to plot Ln(D) against both Ln(*v*) and *v* to see whether the data can be modeled by a power function or an exponential function.

**b)** Determine appropriate parameters for the model type chosen.

**c)** Calculate the relative error of your model.

**d)** Use the model to derive a simple formula for approximating the total stopping distance without a calculator. Illustrate the use of this formula by three examples.