Here X is the predictor (independent variable), and Y is the response (dependent variable).

(a) Fit a regression line, and provide estimates for the intercept β0, the slope β1, and the residual standard deviation σ.

(b) Plot the data, and show the regression line.

(c) What is the expected response for X = 60? What is the expected response for X = 70? Provide 95% confidence intervals.

(d) For both X = 60 and X = 70, provide 95% prediction intervals.

(e) Comment on the lengths of the four intervals.

Data:

Y=c(

541,524,561,414,410,457,344,467,464,498,580,471,525,508,566,635,603,714,865,

640,649,540,464,547,460,566,577,631,574,534,571,554,577,628,487,644,640,704,

648,968,587,699,632,591,782,510,610,524)

X=c(

52.5,57.2,58.0,52.9,54.4,57.1,45.1,55.3,52.9,55.2,53.0,52.5,57.4,54.5,60.8,

58.6,57.2,54.0,72.4,67.7,66.3,60.2,51.1,51.7,55.1,54.4,54.8,57.9,56.3,49.3,

51.8,51.3,57.8,54.7,48.7,62.9,56.6,58.6,66.3,67.2,62.6,56.3,60.3,50.8,67.2,

57.1,62.3,59.3)