

Solutions for Math 148 Quiz Four Version D

1. True or false:

(a) The r.m.s. error for the regression line of x on y never exceeds SD_y .

False

(b) When a scatter diagram is heteroscedastic, the prediction errors are similar in size all along the regression line.

False

(c) We can **NOT** use regression method if there is a non-linear association between variables.

True

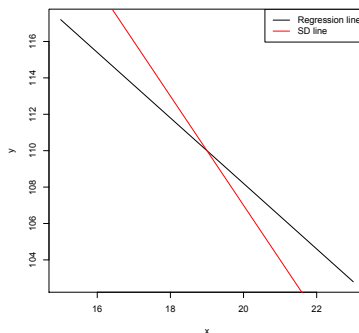
2. The scatter diagram for two variables x and y has the following five point summary:

$$\begin{aligned} \text{average of } x \bar{x} &= 19, \text{ } SD_x = 4, \\ \text{average of } y \bar{y} &= 110, \text{ } SD_y = 12, \text{ } r = -0.6 \end{aligned}$$

(a) Find the equation of regression line for y on x . Draw this regression line and the SD line.

$$\text{slope} = -0.6 \times 12/4 = -1.8$$

$$\text{regression line for } y \text{ on } x \text{ is } y = 144.2 - 1.8x$$



(b) For a vertical strip (group) with $x = 16$, estimate the average of y .

$$y = 144.2 - 1.8 \times 16 = 133.4$$

(c) Calculate the r.m.s. error for the regression line of y on x .

$$\sqrt{1 - (-0.6)^2} \times 12 = 9.6$$