

14-2

3. Given are five observations collected in a regression study on two variables.

$x_i$	2	6	9	13	20
$y_i$	7	18	9	26	23

- a. Develop a scatter diagram for these data.
- b. Develop the estimated regression equation for these data.
- c. Use the estimated regression equation to predict the value of  $y$  when  $x = 6$ .

7. **Sales Experience and Performance.** A sales manager collected the following data on annual sales for new customer accounts and the number of years of experience for a sample of 10 salespersons.

Salesperson	Years of Experience	Annual Sales (\$1000s)
1	1	80
2	3	97
3	4	92
4	4	102
5	6	103
6	8	111
7	10	119
8	10	123
9	11	117
10	13	136

- a. Develop a scatter diagram for these data with years of experience as the independent variable.
- b. Develop an estimated regression equation that can be used to predict annual sales given the years of experience.
- c. Use the estimated regression equation to predict annual sales for a salesperson with 9 years of experience.

14-3

17. The data from exercise 3 follow.

$x_i$	2	6	9	13	20
$y_i$	7	18	9	26	23

The estimated regression equation for these data is  $\hat{y} = 7.6 + .9x$ . What percentage of the total sum of squares can be accounted for by the estimated regression equation? What is the value of the sample correlation coefficient?

19. **Sales Experience and Sales Performance.** In exercise 7 a sales manager collected the following data on  $x$  = annual sales and  $y$  = years of experience. The estimated regression equation for these data is  $\hat{y} = 80 + 4x$ .

Salesperson	Years of Experience	Annual Sales (\$1000s)
1	1	80
2	3	97
3	4	92
4	4	102
5	6	103
6	8	111
7	10	119
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9	11	117
10	13	136

- Compute SST, SSR, and SSE.
- Compute the coefficient of determination  $r^2$ . Comment on the goodness of fit.
- What is the value of the sample correlation coefficient?

14-5

25. The data from exercise 3 follow.

$x_i$	2	6	9	13	20
$y_i$	7	18	9	26	23

- What is the value of the standard error of the estimate?
- Test for a significant relationship by using the  $t$  test. Use  $\alpha = .05$ .
- Use the  $F$  test to test for a significant relationship. Use  $\alpha = .05$ . What is your conclusion?

**\*\* 3、17、25 同一題組；7、19 同一題組**