

## HW Week Oct 4th

1. **Obstetrics** The data in the following table give the infant-mortality rates per 1000 livebirths in the United States for the period 1960-1979.

x	y
year	infant-mortality rate per 1000 live births
1960	26.0
1965	24.7
1970	20.0
1971	19.1
1972	18.5
1973	17.7
1974	16.7
1975	16.1
1976	15.2
1977	14.1
1978	13.8
1979	13.0
$\sum x = 23,670$	$\sum y = 214.9$
$\sum x^2 = 46,689,410$	$\sum y^2 = 4033.83$
$\sum xy = 423,643.3$	

- (a) Fit a linear-regression line relating infant-mortality rate to chronological year using these data.
  - (b) Test for the significance of the linear relationship developed in Part (a).
  - (c) If the present trends continue for the next 10 years, then what would be the predicted infant-mortality rate in 1989?
  - (d) Can the linear relationship developed in Part (a) be expected to continue indefinitely? Why or why not?
2. **Weight loss and Diabetes.** One concern in a study of different regimens in the management of diabetes was weight loss during the course of therapy. The following data pertain to the question of whether the amount of weight loss is related to initial weight. For 16 newly diagnosed adult diabetic patients who received phenformin (DBI) to manage their diabetic state, the following table gives their initial weight at the start of the therapy and their weight loss one year after therapy began. (The value of -3 pounds indicates, of course, a gain rather than a loss in weight.)
- (a) Test the null hypothesis that there has been no change in weight at one year.

x	y
Initial weight (lb)	Weight loss at 1 yr (lb)
225	15
235	44
173	31
223	39
200	6
199	16
129	21
242	44
140	5
156	12
146	-3
195	19
155	10
185	24
150	-3
149	10
$\sum x = 2,902$	$\sum y = 290$
$\sum x^2 = 546,542$	$\sum y^2 = 8,636$
$\sum xy = 58,385$	

- (b) Plot a scatter diagram relating the initial weight to the weight loss at one year.
- (c) Calculate the slope and intercept for the least-squares regression line of weight loss at one year on initial weight.
- (d) Draw the least-squares regression line on your scatter diagram.
- (e) Test the null hypothesis that there is no relation between initial weight and the amount of weight loss at one year.