1. Given the simple random sample data

x	10	22	24	38
y	0.2	1.2	1.2	5

(a). Sketch the scatterplot

(b). Use the summary of data to compute the linear correlation coefficient r

x	y	xy	x^2	y^2
10	0.2	2	100	0.04
22	1.2	26.4	484	1.44
24	1.2	28.8	576	1.44
38	5	190	1444	25
$\sum x =$	$\sum y =$	$\sum xy =$	$\sum x^2 =$	$\sum y^2 =$

$$r = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{\sqrt{n\left(\sum x^2\right) - \left(\sum x\right)^2} \cdot \sqrt{n\left(\sum y^2\right) - \left(\sum y\right)^2}} = \frac{(\quad) - (\quad)(\quad)}{\sqrt{(\quad) - (\quad)^2} \cdot \sqrt{(\quad) - (\quad)^2}}$$

(c). Calculate r on your calculator

(d). Add the data point $x = 46, y = 3.6$ and use your calculator to find the new correlation coefficient.

2. The following sample data set gives the height that a tennis ball bounces when dropped from the indicated height.

Drop Height (in.) x	10	20	30	40	50	60
Bounce Height (in.) y	15.9	47.2	44.1	69.4	90.5	96.5

(a). Sketch the scatterplot

(b). Use your calculator to find the linear correlation coefficient r.
(STAT $\longrightarrow$ TESTS $\longrightarrow$ E: LINREGTTEST $\longrightarrow$ Calculate)

(c). Use $\alpha = .01$ to determine if a linear correlation exists.

3. Using the sample data from page 1

x	10	22	24	38	46
y	0.2	1.2	1.2	5.0	3.6

Recall: The data set with $n = 5$ pairs and $\alpha = .05$ had a correlation coefficient $r = .883$ which was greater than the critical $r_{crit} = .878$. Therefore a linear correlation exists. (The data set with only the first 4 pairs did not have a linear correlation.)

(a). Use the summary of data to compute the slope b_1 and the intercept b_0

x	y	xy	x^2	y^2
10	0.2	2	100	0.04
22	1.2	26.4	484	1.44
24	1.2	28.8	576	1.44
38	5.0	190	1444	25
46	3.6	165.6	2116	12.96
$\sum x = 140$	$\sum y = 11.2$	$\sum xy = 412.8$	$\sum x^2 = 4720$	$\sum y^2 = 40.88$

$\bar{x} =$ $\bar{y} =$

$$\text{slope } b_1 = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{n\left(\sum x^2\right) - \left(\sum x\right)^2} = \frac{(\quad) - (\quad)(\quad)}{(\quad) - (\quad)^2} =$$

intercept $b_0 =$

(b). Find the slope and intercept on your calculator. (STAT $\longrightarrow$ TESTS $\longrightarrow$ E: LINREGTTEST $\longrightarrow$ Calculate)

(c). Write down the regression equation.

(d). Use the regression equation to determine the predicted value for $x = 40$.

4. Using the Tennis Ball Bounce Height dat set

Drop Height (in.) x	10	20	30	40	50	60
Bounce Height (in.) y	15.9	47.2	44.1	69.4	90.5	96.5

(a). Find the slope and intercept on your calculator. (STAT $\longrightarrow$ TESTS $\longrightarrow$ E: LINREGTTEST $\longrightarrow$ Calculate)

(b). Write down the regression equation.

(c). Use the regression equation to determine the predicted the bounce height if the ball is dropped from 25 in.

Homework:
Section 10.2, p. 530: #2, 3, 4, [5, 7, 9, 13, 19, 23, 25, 29]
Section 10.3, p. 547: #1, 4, [5, 7, 9, 13, 19, 23, 25, 29]