Math 108 **Exam 1** **Fall '02**

The following frequency distribution will be used in the next three questions. The variable is assumed to be continuous. Show your work.

value	%
0–6	10
6–10	10
10–13	9
13–15	8
15–17	9
17–20	11
20–25	15
25–30	10
30–40	12
40–50	6

1. Which bracket contains the median?
2. Which bracket contains the mode?
3. Which bracket contains the 65-th percentile?

The following is data for a scatter diagram. It is used in the next two questions.

x	y
1	5
1	8
3	3
3	6
7	6
9	2

4. What is the correlation coefficient for this data?
5. What is the formula for the SD line in slope-intercept form (i.e., in the form $y = mx + b$).

Supppose given a binormal distribution with

$$\overline{x} = 120 \qquad \overline{y} = 90$$
$$\mathrm{SD}(x) = 50 \quad \mathrm{SD}(y) = 40 \quad r = -.85$$

We study it in the next five questions.

6. What is the regression estimate for $x = 80$?
7. What is the slope-intercept formula for the regression line ($y = mx + b$)?
8. Suppose the x-value is in the 80-th percentile. What is the percentile value of its regression estimate?
9. Suppose $y = 120$. What is the regression estimate for predicting the value of x from that of y?
10. What percent of the x-values are between 100 and 150?

Supppose given a binormal distribution with

$$\overline{x} = 200 \qquad \overline{y} = 150$$
$$\mathrm{SD}(x) = 80 \quad \mathrm{SD}(y) = 50 \quad r = .8$$

Control for $x = 300$.

11. What is the average after controlling?
12. What is the standard deviation after controlling?
13. What is the 40-th percentile of the controlled y-distribution?
14. What percent of the controlled y-values are between 140 and 180?
15. What percent of the controlled y-values are above 180?