

Statistics 108**Exam 1 (9/27/13)**

Questions 1-4: Suppose, because of a recent gas pipeline explosion, a large power utility company wants to measure its public image among all customers in its service area. The company divided its service area into sub-regions and then randomly sampled 5% of its customers in each sub-region and mailed them a survey. The survey contained a self-addressed stamped envelope for the customer to return the survey. The response rate was 37%; that is, 37% of the surveys were answered and returned. 78% of the customers who returned the survey held a positive image of the company.

(1) 1 point. Which best describes the sampling method used: (circle)

- a. Systematic
- b. Stratified
- c. Cluster

(2) 2 points. The "78%" is a: (circle)

- a. Statistic
- b. Parameter
- c. Census

(3) 2 points. One question in the survey was: *To what degree do you agree or disagree with the statement: "Our utility company places safety over profit." Strongly Disagree? Disagree? Neither agree nor disagree? Agree? Strongly Agree?* This response is: (circle)

- a. Qualitative: Nominal
- b. Qualitative: Ordinal
- c. Quantitative: Discrete
- d. Quantitative: Continuous

(4) 2 points. What is the population in this study? _____

(5) 2 points. In one sentence, describe what makes an experiment be a double-blind experiment?

- (6) In the fall semester last year, there were 228 tenured or tenured track professors at Humboldt State of which 89 were female.
- 1 point. If you were to draw a pie chart for these data, how many degrees would the slice for females be? (Show work)
 - 1 point. Sketch the pie chart.

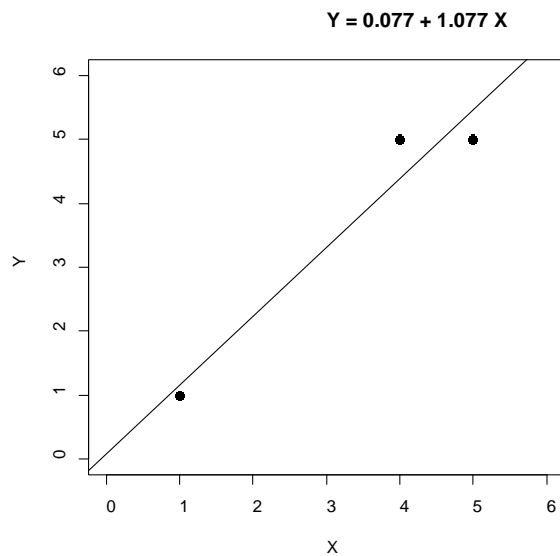
- (7) In the fall semester last year, the student ethnicity and gender data for Humboldt were:

	Female	Male	Total
Black	135	156	291
Asian American	121	127	248
Hispanic/Latino	1062	738	1800
White	2218	2054	4272
Other/Unknown	820	785	1605
Total	4356	3760	8116

- 1 point. What percent of the students were female? (Show work)
 - 1 point. Among Hispanic/Latino students, what percent were female? (Show work)
 - 1 point. What percent of students were white males? (Show work)
- (8) 2 points. Calculate the **variance** for the three values: 2, 3, 10. (Circle answer and show work.)

- (9) 2 points. Explain in one or two sentences why the median rather than mean is typically used to describe housing prices.

- (10) The below least-squares regression was performed on three data points. The regression equation is provided at the top of the graph.



- a. 2 points. What is the predicted value for the data point at (5,5)? (Show work)
- b. 2 points. What is the residual value for the data point at (5,5)? (Show work)
- c. 1 point. Which point has the most leverage? Circle: (1,1), (4,5), (5,5)
- d. 1 point. For these three points, could the regression line be changed (either a different y intercept and/or a different slope) so that the sum of the squared residuals can be made smaller than what the sum of the square residuals already is with the provided regression line? Yes or No? Explain in a single sentence.