

# Math 153 - Quiz 1

February 6, 2014

Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) In studying the literary works of a particular author, a researcher has determined the author's average number of words per paragraph.

- (a) Are the numbers of words per paragraph discrete or continuous data?

DISCRETE

- (b) Identify the level of measurement (nominal, ordinal, interval, ratio) for the numbers of words per paragraph.

RATIO -- THERE CAN BE TWICE AS MANY WORDS IN ONE PARAGRAPH THAN ANOTHER.

- (c) In a sample of several of the author's books, the average number of words per paragraph was found to be 63. Is this number a statistic or parameter?

STATISTIC -- IT WAS OBTAINED FROM A SAMPLE, NOT FROM THE POPULATION.

- (d) Five of the author's books were selected at random, and the numbers of words per paragraph were counted and recorded for each paragraph in all five of the books. What kind of sampling is this?

CLUSTER SAMPLING

- (e) What is wrong with the following question: "Do you think the vulgar and obscene works of this author should be available for children to read?"

IT'S A LOADED QUESTION. FEW PEOPLE WANT CHILDREN TO READ "VULGAR AND OBSCENE WORKS," SO MOST PEOPLE WOULD BE LEAD TO ANSWER "NO" EVEN IF THEY THOUGHT THE WORKS SHOULD BE AVAILABLE.

2. (5 points) Bags of a certain brand of corn chip are supposed to contain 10.25 oz of chips. The following frequency distribution, showing the weights of corn chips per bag, was obtained from a sample of 50 bags.

Weights (oz)	Frequency
10.10–10.15	4
10.16–10.21	9
10.22–10.27	21
10.28–10.33	11
10.34–10.39	5

- (a) What are the class boundaries?

$$10.095, 10.155, 10.215, 10.275, 10.335, 10.395$$

- (b) What is the class width?

$$10.16 - 10.10 = \boxed{0.06}$$

- (c) If the frequency distribution was changed to a cumulative frequency distribution, what count would be associated with "Less than 10.335 oz"?

$$4 + 9 + 21 + 11 = \boxed{45}$$

- (d) Do the weights appear to be normally distributed?

THE DATA APPEARS TO BE APPROXIMATELY NORMAL ---  
PEAKED IN THE MIDDLE, TAPERING OFF ON BOTH ENDS,  
ROUGHLY SYMMETRIC.

- (e) Using interval midpoints, estimate the mean weight of a bag of these corn chips.

$$\begin{aligned} \bar{X} &\approx \frac{10.125(4) + 10.185(9) + 10.245(21) + 10.305(11) + 10.365(5)}{50} \\ &= \frac{512.49}{50} = \boxed{10.2498} \end{aligned}$$