Feedback — Midterm Part 2

Help

You submitted this exam on **Sun 23 Mar 2014 11:47 AM PDT**. You got a score of **12.00** out of **15.00**.

Question 1

Part 2

A class of introductory statistics students took a 15 item quiz, with each item worth 1 point. The standard deviation for the resulting score distribution is 0. You know that:

- about half of the scores were above the mean
- the mean, median, and mode must all be 0
- everyone correctly answered the same number of items
- an arithmetic error must have been made

Question 2

A group of researchers want to test the possible effect of an epilepsy medication taken by pregnant mothers on the cognitive development of their children. As evidence, they want to estimate the IQ scores of three-year-old children born to mothers who were on this particular medication during pregnancy. Previous studies suggest that the standard deviation of IQ scores of three-year-old children is 18 points. At least how many such children should the researchers sample at a minimum in order to obtain an **80% confidence** interval with a **margin of error of at most 4 points**?

- 78
- 34
- 33
- 55
- 56

Question 3

The Washington Post and the New York Times conducted separate national polls on the same issue.

- The Washington Post surveyed 500 people and reported a 95% confidence interval.
- The New York Times surveyed 150 people and also reported a 95% confidence interval.

Which paper reported a **larger** margin of error?

Assume that all else are equal between the two polls, they are sampling the same population on the same issue.

- The margin of errors are the same.
- The Washington Post
- The New York Times

Question 4

In a recent Gallup poll on a random sample of 1,028 US adults, 11% said they approve of the way the Congress is handling its job, with a 95% confidence interval of 7% to 15% (7%, 15%).

Which of the following statements is **false** based on this confidence interval?

- 95% of random samples of 1,028 US adults will have sample proportions between 0.07 and 0.15.
- The sample proportion is 0.11.
- The margin of error is 0.04.
- It is unlikely, but possible, that the population proportion is 0.18.

Question 5

Fill in the blank: The spread of the sampling distribution for the sample mean is mainly determined by the magnitude of the _____.

Choose the **best** option among the provided choices.

- confidence level
- population size
- population mean
- sample mean
- sample size

Question 6

Imagine we were to construct a number of sampling distributions of a sample mean, where the only difference between each distribution is the sample size used. For each distribution constructed in this way we record the standard error and sample size.

Fill in the blank: The correlation between these two variables will be _____.

Choose the **best** option among the provided choices.

- positive
- negative
- zero
- one

Question 7

Which of the following is most likely to be **true**?

- The Z score for the median of a distribution of any shape is 0.
- Majority of the values in a right skewed distribution have positive Z scores.
- An observation with a Z score of Z = -1.2 is more unusual than an observation with a Z score of Z = +0.5 coming from the same distribution.
- The median of a left skewed distribution has a negative Z score.
- Half the observations in a distribution of any shape have positive Z scores.

Question 8

A behavioral economist designing an experiment to evaluate people's decision making patterns wants to make sure that sampled males and females are equally represented in the treatment and control groups. Which of the following approaches will be **most** useful?

- (•) random assignment
- ( ) random sampling
- ( ) clustering
- ( ) blinding
- ( ) blocking

Question 9

True or False: In a normal distribution, Q1 and Q3 are more than one standard deviation away from the mean.

Hint: Think about what percentiles Q1 and Q3 correspond to.

- ( ) False
- (•) True

Question 10

Suppose half of all newborns are girls and half are boys.

- Hospital A, a large city hospital, records an average of 50 births a day.
- Hospital B, a small, rural hospital, records an average of 10 births a day.

On a particular day, which hospital is **less likely** to record 80% or more female births?

- ( ) This outcome is not possible at either hospital.
- (•) Hospital A (with 50 births a day), because the more births you see, the closer the proportions will be to 0.5.
- ( ) The two hospitals are equally likely to record such an event, because the probability of a boy does not depend on the number of births.
- ( ) Hospital B (with 10 births a day), because with fewer births there will be less variability.

Question 11

Each of the 120 students in a statistics class selects a different random sample of 40 quiz scores from a population of 5000 scores they are given. Using their data, each student constructs a 90% confidence interval for μ, the average quiz score of the 5000 students. Which of the following conclusions is **correct**?

- About 10% of the sample means will not be included in the confidence intervals.
- 90% of the confidence intervals will be identical.
- About 90% of the confidence intervals will contain μ.
- About 10% of the individual quiz scores in the samples will not be found in these confidence intervals.

Question 12

Colin, a first-year college student, is enrolled in a college algebra course and earned a score of 260 on a math achievement test that was given out to all first-year students prior to enrollment. The instructor looked at two distributions of scores:

1. the distribution for all first-year students
2. the distribution for the first-year students enrolled in this algebra course

Both are approximately normally distributed and have the same mean, but the distribution for the algebra course has a smaller standard deviation. A Z score is calculated for Colin's test score in both distributions (all first-years and the first-years taking this algebra course). Given that Colin's score is well above the mean, which of the following is **true** about these two Z scores?

- The Z score based on the distribution for the first-year students taking algebra would be higher.
- The Z score based on the distribution for all first-year students would be higher.
- The two Z scores would be the same.
- The two Z scores would be different, but we don't have enough information to tell which Z score would be higher.

Question 13

Two polling agencies, Gallup and Public Policy Polling, want to estimate the proportion of American college students who are in favor of same-sex marriage. They both want to have about the same margin of error to estimate this proportion. However, Gallup wants to estimate with 99% confidence and Public Policy Polling wants to estimate with 95% confidence. Which agency would need **more** students for their survey in order to obtain the desired margin of error?

- Both agencies would need the same number of subjects.
- Public Policy Polling.
- It is impossible to obtain the same margin of error with the two different confidence levels.
- Gallup.

Question 14

Answer questions 14 and 15 based on the information below.

A June Gallup poll asked US residents about their opinion on sales taxes on internet purchases. The results of the poll are summarized in the table below. The text of the survey question is also provided above the table. One of the values on the table is 73% (marked). Which of the following **best** describes this probability?

Next, suppose that on Election Day you could vote on key issues as well as candidates. Would you vote for or against a law that would allow each state to collect sales taxes on purchases its residents make online over the Internet?

	For	Against	No opinion
	%	%	%
National adults	39	57	4
18 to 29 years	27	73	0
30 to 49 years	35	62	3
50 to 64 years	50	46	4
65+ years	46	46	8

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- P(Against)
- P(18 to 29 years | Against)

- P(Against and 18 to 29 years)
- P(Against | 18 to 29 years)
- P(18 to 29 years)

Question 15

Fill in the blank: Based on these results, opinion on sales taxes on internet purchases and age appear to be _____.

- mutually exclusive
- dependent
- independent
- disjoint
- complementary