STAT 5: All Quiz Questions with Solution

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1. Quiz 1

Question 1

Which of these is an example of a placebo effect?

- People given an empty capsule report that it helped their fever go down
- People given an empty capsule report that it had no effect
- People given an aspirin capsule report that it helped their fever go down
- People given an aspirin capsule report that it had no effect

Question 2

Which of these is a reason for doing blinded studies?

- Patients who know they are getting a placebo may be more likely to drop out of the study
- Patients who know they are getting the placebo may talk to their friends about it
- Patients who know they are getting the placebo may experience side effects
- Patients who know they are getting the placebo may engage in riskier behavior

Question 3

In trying to study a possible relationship between asbestos exposure and lung disease, researchers also record whether the subject is a smoker. Which of these is a possible confounder in this study?

- Smoking
- Asbestos exposure
- Lung Disease

Question 4

Suppose a town is divided into five wards. In each ward, the percentage of registered Democrats who vote is higher than the percentage of registered Republicans who vote. Is it possible that for the town as a whole, the percentage of registered Republicans who vote is higher than the percentage of Democrats who vote?

- Yes, if the those wards with higher overall voting percentages have more registered Republicans, and wards with lower overall voting percentages have more registered Democrats
- No, for the town as a whole, the percentage of registered Democrats that vote must be higher than the percentage of registered Republicans who vote
- Yes, if all of the wards have equal numbers of registered Democrats and registered Republicans

Question 5

A car dealer looks at all they cars sold in the last year to see if buyers of economy cars are more or less likely to get a car loan from the dealer than are buyers of luxury cars. What type of study is this?

- Observational study
- Double-blind study
- Historical control study
- Controlled experiment

2. Quiz 2

Question 1

What is the average of 12, 14, and 19?

- 15 (with margin: 0)

Question 2

What type of variable is the color of a car?

- Qualitative
- Quantitative - continuous
- Quantitative - discrete

Question 3

Suppose an exam has an average score of 70 with a standard deviation of 10. How many standard units is a score of 82?

- 1.2 (with margin: 0)

Question 4

What is the area under the normal curve to the left of -0.05?

- 48.0%
- 3.99%

- 96.01%
- 2.0%
- 38.29%
- 30.86%

Question 5

Find the area under the normal curve between -0.05 and 0.05

- 3.99%
- 96.01%
- 2.0%
- 38.29%
- 48.0%
- 70.63%

3. Quiz 3

Question 1

A statistics student takes a test containing 10 true/false questions. If x is the number of questions that the student gets right and y the number wrong, what is the correlation between x and y?

- -1
- 1
- 0
- -0.5
- 0.5

Question 2

Which of the following number cannot be a legitimate correlation between two variables?

- 1.20
- 0.00
- 0.20
- 0.80
- -0.20

Question 3

A linear regression of a husband's height (x) versus a wife's height (y) gives the fitted equation (least squares line) y=.25x+48 (the units are inches). Make a prediction of the wife's height when the husband is 72 inches tall.

- 66
- 64
- 60
- 72
- 68

Question 4

In a linear regression relating a variable y to a variable x, the correlation between the two variables is 0.8, the standard deviation of the y values is 2, and the standard deviation of the x values is 1. What is the slope of the best fitting line?

- 1.6
- 0.4
- 0.8
- -1.0
- 1.0

Question 5

Between which of the following variable pairs would you expect negative correlation?

- x= amount of time someone works, y = amount of free time one has
- x = time you spend running on a treadmill, y = number of calories you will burn
- x = amount of gasoline in car, y= the distance you can travel (non-stop)
- x = height of a child, y = shoe size of child

4. Quiz 4

Question 1

A fair six-sided die is rolled once. What are the chances that the number appearing on its face is odd?

- 1/2
- 1/3
- 2/3
- 5/6
- 1

Question 2

A fair coin is tossed twice in an independent fashion. What are the chances that both tosses are heads?

- 1/4
- 1/3
- 2/3

- 1/2
- 3/4

Question 3

Suppose that A and B are events. The chances of A occurring is 2/3 and the chances of B occurring is 3/4. Which one of the following statements is necessarily true?

- A and B are not disjoint
- A and B are independent
- A and B are mutually exclusive
- If B occurs, then A does too

Question 4

The chance that a hiker sees at least one banana slug during a hike is 0.4. 0.712Over three independent hikes, what are the chances that exactly one hike is banana slug free?

- 0.288
- 0.096
- 0.712
- 0.904

5. Quiz 5

Question 1

What is the mean of a random draw from the box {-1, 0, +1}?

- 0
- 1
- -1
- 2
- -2

Question 2

To two decimal places, what is the standard deviation of a random draw from the box {-1,0,+1}?

- 0.82
- 0.67
- 0.33
- 0.00

Question 3

A random draw from a box has a mean of 10. What is the mean of the sum of 20 draws from this box?

- 200
- 10
- 1/2
- 30

Question 4

A random draw from a box has mean of 5 and a standard deviation of 1. What is the standard error for the sum of 100 random draws from this box?

- 10
- 100
- 0.01
- 1000

Question 5

Consider 100 independent tosses of a fair six-sided die and suppose that we seek to count the number of rolls that result in 6. Which is the correct box for this problem?

- [0,0,0,0,0,1]
- [0,1]
- [1,2,3,4,5,6]
- [1,6]

6. Quiz 6

Question 1

Two fair six-sided dice are rolled and the sum of the two faces is observed. What is the preferred box model for this scenario?

- Two independent draws from [1,2,3,4,5,6]
- Four independent draws from [1,2,3]
- One draw from [2,3,4,5,6,7,8,9,10,11,12]
- Six independent draws from [1,2]

Question 2

A coin, which is known to be biased toward heads, is repeatedly and independently flipped n times. If there are more heads than tails on the n trials, you win $$$500. You get to select the number of tosses n. Which n should you prefer?

- n=1,000,000
- n=1
- n=10
- n=1,000
- n=10,000

Question 3

A fair coin is independently tossed 100 times. What is the mean and standard error (se) of the number the number of heads obtained?

- mean=50, se=5
- mean=.5, se=10
- mean=100, se=50
- mean=50, se=10

Question 4

A fair coin is flipped 100 times. Approximate the chances that between 48 and 52 heads are obtained.

Hint: Use the continuity correction!

- 0.38
- 0.62
- 0.19
- 0.68

Question 5

What are the exact chances of getting four rainy days in a week of seven independent days if the daily chance of rain is 1/2?

- 35/128
- 35/16
- 1/64
- 93/128

7. Quiz 7

Question 1

A local university has 25,000 students, of whom 10,000 are younger than 20 years old. A random sample of size 100 students is drawn from this university. Which one of the following statements is false?

- 10,000 students less than 20 years old are expected in the sample
- 40 students less than 20 years old are expected in the sample
- The exact proportion of students at the university that are less than 20 years old is 2/5
- The expected proportion of students less than 20 years old in the sample is 2/5

Question 2

A fair six-sided die is rolled independently 100 times. What is the standard error for the proportion of times an even number is obtained over the 100 rolls?

- 0.05 or 5%
- 0.10 or 10%
- 0.01 or 1%
- 0.25 or 25%

Question 3

A fair coin is independently tossed 1,000 times. You will win a new house if one of the following options occurs. Which option gives you the best chance of winning the house?

- Option 1: The proportion of heads is between 48% and 52%
- Option 2: You get exactly 500 heads
- Option 3: You get between 490 and 510 heads, inclusive
- Option 4: The proportion of heads is exactly 50%

Question 4

Which of the following yields an approximate 95% confidence interval?

- The mean plus/minus 2 standard errors
- The mean plus/minus 1 standard errors
- The mean plus/minus 3 standard errors
- 2 standard errors plus/minus the mean

Question 5

Which confidence interval is the widest?

- A 99% confidence interval
- A 95% confidence interval
- A 90% confidence interval
- A 80% confidence interval

8. Quiz 8

Question 1

A single random draw from a box has mean 10 and a standard deviation of 3. What is the standard error of the average of nine draws from the box?

- 1
- 9
- 3
- 1/3

Question 2

A single random draw from a box has mean 10 and a standard deviation of 3. What is the expected value of the average of nine draws from the box?

- 10
- 1.11
- 3
- 90

Question 3

A state trooper clocks the speed of 100 randomly selected cars on Interstate 80 and obtains a sample mean of 70 mph and a sample standard deviation of 10 mph. Which of the following is an approximate 95% confidence interval for the true mean speed of cars at this location?

- [68,72]
- [66,74]
- [70,75]
- [65,70]

Question 4

Consider a box containing the three tickets 1, 2, 3 and suppose that 49 draws are made at random from this box. To three decimal places, what is one standard error for the sample average of these draws?

- 0.117
- 0.816
- 5.715
- 0.342

Question 5

Which of the following cannot be a 95% confidence interval for the true proportion of California voters that prefer Joe Biden to Donald Trump in the presidential election?

- [50,70]
- [0.5,0.7]
- [0.1,0.9]
- [0.45,0.90]

Question 6

A coin is flipped 100 independent times in an effort to assess whether it is fair. Of these 100 flips, 40 result in heads. Which of the following is an approximate 95% confidence interval for the true heads proportion?

- [0.302,0.498]
- [0.380,0.420]
- [0.200,0.600]
- [0.351,0.449]

9. Quiz 9

Question 1

Which of the following P-values is most suggestive of the alternative hypothesis?

- 0.001
- 0.01
- 0.1
- 0.9

Question 2

Which of the following P-values is most suggestive of the null hypothesis?

- 0.9
- 0.1
- 0.01
- 0.001

Question 3

A carmaker seeks to design a new vehicle that has better gas mileage than the industry standard of 30 miles per gallon. The carmaker will measure the gas mileage in 100 of these new vehicles. What should be the carmaker's statistical null hypothesis?

- The new vehicle's gas mileage is 30 miles per gallon
- The new vehicle's gas mileage is greater than 30 miles per gallon
- The new vehicle's gas mileage is 35 miles per gallon
- The new vehicle's gas mileage is less than 25 miles per gallon

Question 4

Which of the following is the area to the right of 4.30 under the Student's t curve with two degrees of freedom?

- 0.025 (2.5%)
- 0.010 (1.0%)
- Less than .01 (less than 1.0%)
- More than .05 (more than 5.0%)

Question 5

A manufacturer making supposedly 0.25 mm diameter screws randomly samples 100 of the screws and measures their diameters. The average of these is 0.252 mm and

the standard deviation is .01 mm. What is the P-value for a hypothesis test that the true mean screw diameter is .25 mm versus the alternative that it is not .25 mm?

- 0.0455
- 0.0134
- 0.134
- 0.00265

Question 6

In two high schools, Rap Station and Metal Cove, music comprehension tests were given to 100 students at each school. At Rap Station, the average score of the students was 47.3 and the standard deviation was 4.0. At Metal Cove, the average score was 47.8 and the standard deviation was 3.0. What is the absolute value of the Z statistic used to test the hypothesis that the two schools have the same mean music comprehension of students?

- 1.0
- 1.5
- 0.5
- 2.0