

MAT121 Quiz 07

Problem 1

A major metropolitan newspaper selected a simple random sample of 1,600 readers from their list of 100,000 subscribers. They asked whether the paper should increase its coverage of local news. Forty percent of the sample wanted more local news. What is the 99% confidence interval for the proportion of readers who would like more coverage of local news?

- (A) 0.30 to 0.50
- (B) 0.32 to 0.48
- (C) 0.35 to 0.45
- (D) 0.37 to 0.43

Answer: D

Problem 2.

A survey was conducted at a local college to find the percentage of freshmen who were taking a math course. The results found that 75% were taking a math course with a margin of error at $\pm 4\%$. What is the confidence interval?

- (A) (0.72, 0.77)
- (B) (0.67, 0.82)
- (C) (0.91, 0.99)
- (D) (0.71, 0.79)

Answer: D.

Problem 3.

1,600 of 2,000 voters say they plan to vote Republican. Use 0.95 degree of confidence to find the population proportion interval.

- A. 69.2 to 86.4%
- B. 76.5 to 83.5%
- C. 77.7 to 82.3%
- D. 78.2 to 81.8%

Answer: D.

Problem 4.

The mean weight of trucks traveling on the highway is unknown. A state highway inspector needs an estimated mean. He selects 25 trucks passing the weighing station and gets a mean of 15.8 tons, with standard deviation of the sample of 3.8 tons. Assume that weights of trucks are normally distributed. Using the 95% of confidence level, what is the confidence interval within which the population mean lies?

- A. 14.23 and 17.37
- B. 14.31 and 17.29
- C. 11.08 and 20.52
- D. 12.45 and 19.13

Answer: A.

Problem 5

In a random sample of 81 teenagers, the average number of texts handled in a day was 50 with a standard deviation of 15. What is the 95% confidence interval for the average number of texts handled by teens daily?

- A. $50 \pm 1.96(15)$
- B. $50 \pm 1.96(5/3)$
- C. $50 \pm 1.96(5/9)$
- D. $50 \pm 1.96(15/3)$

Answer: B.

Problem 6.

One gallon of gasoline is put in each of 36 test autos, and the resulting mileage figures are tabulated with $\bar{x} = 28.5$ and $s = 1.2$. Determine a 95% confidence interval estimate of the mean mileage.

- A. (28.46, 28.54)
- B. (28.42, 28.58)
- C. (28.11, 28.90)
- D. (27.36, 29.64)

Answer: C.

Problem 7.

The National Research Council of the Philippines reported that 210 of 361 members in biology are women. Find the margin of error for constructing a 95% confidence interval estimate of women in biology in the Philippines,

- A. 0.051
- B. 0.54
- C. 0.95
- D. 1.96

Answer: A.

Problem 8.

A catch of five fish of a certain species yielded the following ounces of protein per pound of fish: 3.1, 3.5, 3.2, 2.8, and 3.4. We can calculate the sample mean and standard deviation to be 3.20 and 0.27 respectively. Assume that the protein contents are normally distributed. What is a 90% confidence interval estimate for ounces of protein per pound of this species of fish?

- A. 3.2 ± 0.257
- B. 3.2 ± 0.237
- D. 4.0 ± 0.257
- E. 4.0 ± 0.237

Answer: A.

Problem 9.

Acute renal graft rejection can occur years after the graft. In one study (The Lancet, December 24, 1994, page 1737), 21 patients showed such late acute rejection when the ages of their grafts (in years) were 9, 2, 7, 1, 4, 7, 9, 6, 2, 3, 7, 6, 2, 3, 1, 2, 3, 1, 1, 2, and 7, respectively. The mean and the standard deviation are 4 and 2.8. Assume that ages of renal grafts are normally distributed. What is the margin of error for constructing a 90% confidence interval estimate for the ages of renal grafts that undergo late acute rejection.

- A. 0.799
- B. 1.725
- C. 0.799
- D. 1.041

Answer D.

Problem 10

What is the critical t-value for finding a 90% confidence interval estimate from a sample of 15 observations?

- A. 1.341
- B. 1.761
- C. 1.350
- D. 1.753

Answer. B.

Problem 11.

Suppose (25, 30) is a 90% confidence interval estimate for a population mean μ . Which of the following is the margin of error?

- A. 5.
- B. 2.5.
- C. 27.5.
- D. 1.645

Answer. B.

Problem 12

Nine subjects, 87 to 96 years old, were given 8 weeks of progressive resistance weight training (Journal of the American Medical Association, June 13, 1990, page 3032). Strength before and after training for each individual was measured as maximum weight (in kilograms) lifted by left knee extension:

Before:	3	3.5	4	6	7	8	8.5	12.5	15
After:	7	17	19	12	19	22	28	20	28

The difference between after and before training are: 4, 13.5, 15, 6, 12, 14, 19.5, 7.5, 13. Assume that all differences are normally distributed.

Find a 95% confidence interval estimate for the strength gain.

- A. 11.61 ± 3.03
- B. 11.61 ± 3.77
- C. 19.11 ± 1.25
- D. 19.11 ± 3.69

Answer. B.