1. The height (in inches) of adult males in the United States is believed to be normally distributed with mean μ. The average height of a random sample of twenty-five American adult males is found to be $\bar{x}$ = 69.72 inches, and the standard deviation of the twenty-five heights is found to be s = 4.15. A 90% confidence interval for μ is

- A. 69.72 ± 1.09.
- B. 69.72 ± 1.37.
- C. 69.72 ± 1.42.

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2. We wish to see if the dial indicating the oven temperature for a certain model oven is properly calibrated. Four ovens of this model are selected at random. The dial on each is set to 300ºF, and, after one hour, the actual temperature of each is measured. The temperatures measured are 305º, 310º, 300º, and 305º. Assuming that the actual temperatures for this model when the dial is set for 300º are normally distributed with mean μ, we test whether the dial is properly calibrated by testing the hypotheses $H_0: \mu = \mu_0$ versus $H_a: \mu \neq \mu_0$. Based on the data, the P-value for this test is

- A. between 0.10 and 0.05.
- B. between 0.05 and 0.025.
- C. between 0.025 and 0.01.

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3. Do students tend to improve their SAT mathematics (SAT-M) score the second time they take the test? A random sample of four students who took the test twice received the following scores.

Student	1	2	3	4
First Score	450	520	720	600
Second Score	440	600	720	630

Assuming that the change in SAT-M score (second score - first score) for the population of all students taking the test twice is normally distributed with mean μ, a 95% confidence interval of μ is

- A. 25.0 ± 64.29.
- B. 25.0 ± 56.09.
- C. 25.0 ± 39.60.

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4. You are thinking of using a *t* procedure to construct a 95% confidence interval for the mean of a population. You suspect the distribution of the population is not normal and may be skewed. Which of the following statements is correct?

- A. You should not use the *t* procedure because the population does not have a normal distribution.
- B. You may use the *t* procedure, provided your sample size is large, say at least 40.
- C. You may use the *t* procedure because it is robust to nonnormality.

5. I did an eggsperiment with a fellow instructor one day. His calculus class was studying volumes of solids by rotating curves around the x-axis. We modeled the volume of an egg as an ellipsoid, and measured eggs with calipers, using the calculus formula. Each egg was also measured for volume using a water displacement method. We wanted to know if the two methods agreed or not. The data were

Egg	Calculus	Water Displacement
1	60.90	60
2	50.77	58.5
3	49.99	45
4	79.16	75
5	75.91	65
6	54.7	55
7	64.9	62.5
8	62.14	60
9	57.62	60

The value of the test statistic for the test is

- A. t = 0.975
- B. t = 0.387
- C. z = 0.975

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6. The value of t* for a 95% confidence interval when there were 10 pieces of data is

- A. 2.262
- B. 2.228
- C. 1.833

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7. I took a sample of the grade point averages for students in my class. For 25 students, the standard deviation of grade points was 0.65 and the mean was 2.89. The standard error for the sample was

- A. 0.578
- B. 0.026
- C. 0.13

8. I took a sample of the grade point averages for students in my class. For 25 students, the standard deviation of grade points was 0.65 and the mean was 2.89. A 95% confidence interval for the average grade point average for all students in my class is

- A. (2.64, 3.14)
- B. (2.62, 3.16)
- C. (2.53, 3.25)

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9. For small samples, t intervals are ____________ z intervals based on the same data set.

- A. Narrower
- B. The same as
- C. Wider

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10. Do students tend to improve their SAT mathematics (SAT-M) score the second time they take the test? A random sample of four students who took the test twice received the following scores.

Student	1	2	3	4
First Score	450	520	720	600
Second Score	440	600	720	630

Assuming that the change in SAT-M score (second score - first score) for the population of all students taking the test twice is normally distributed with mean μ, are we convinced that retaking the test improves scores? Find the *P*-value for a test of $H_0: \mu_1 = \mu_2$ versus $H_a: \mu_1 < \mu_2$.

- A. more than 0.75
- B. more than 0.10
- C. less than 0.01