

- 1: If you know a population's standard deviation is 4.5, how large of a sample size is needed for the margin of error to be 0.5 when making a 95% confidence interval?

- 2: The following ten numbers were drawn from a normal distribution:

6.61 7.78 7.73 7.5 7.5 8.42 7.73 8.19 7.54 7.08

Those ten numbers have a mean of 7.608 and a sample standard deviation of 0.512. Find a 90% confidence interval for the population mean.

- 3: With a significance level of 0.02, test whether these two samples came from populations with equal means.

Sample 1
0.086 0.103 0.101 0.13 0.121 0.108

Sample 2
0.187 0.172 0.122 0.168

- 4: Ten students' scores on two exams are shown below. Determine a 95% confidence interval of the mean difference.

| student | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---------|------|----|------|------|------|------|------|------|------|------|
| exam 1 | 84.4 | 68 | 76.2 | 84.4 | 84.6 | 88.4 | 78.6 | 93.8 | 53.6 | 76.3 |
| exam 2 | 87.1 | 71 | 84.3 | 95.9 | 91.9 | 96.5 | 88.8 | 91.4 | 65.3 | 79.7 |

5: Let X and Y represent two populations.

$$X \sim \mathcal{N}(45, 7)$$

$$Y \sim \mathcal{N}(50, 9)$$

Let W represent a sampling distribution when drawing 5 from each population and finding the difference of means.

$$W = \frac{Y + Y + Y + Y + Y}{5} - \frac{X + X + X + X + X}{5}$$

The central limit theorem tells us W is normally distributed. Determine the mean and standard deviation of W .