

- s = sample standard deviation.

The format for the confidence interval is:

$(\bar{x} - EBM, \bar{x} + EBM)$.



USING THE TI-83, 83+, 84, 84+ CALCULATOR

To calculate the confidence interval directly:

Press STAT.

Arrow over to TESTS.

Arrow down to 8: TInterval and press ENTER (or just press 8).

EXAMPLE 8.8

Problem

Suppose you do a study of acupuncture to determine how effective it is in relieving pain. You measure sensory rates for 15 subjects with the results given. Use the sample data to construct a 95% confidence interval for the mean sensory rate for the population (assumed normal) from which you took the data.

The solution is shown step-by-step and by using the TI-83, 83+, or 84+ calculators.

8.6; 9.4; 7.9; 6.8; 8.3; 7.3; 9.2; 9.6; 8.7; 11.4; 10.3; 5.4; 8.1; 5.5; 6.9

Solution

- The first solution is step-by-step.
- The second solution uses the TI-83+ and TI-84 calculators.

To find the confidence interval, you need the sample mean, \bar{x} , and the EBM .

$$\bar{x} = 8.2267 \quad s = 1.6722 \quad n = 15$$

$$df = 15 - 1 = 14 \quad CL \text{ so } \alpha = 1 - CL = 1 - 0.95 = 0.05$$

$$\frac{\alpha}{2} = 0.025 \quad t_{\frac{\alpha}{2}} = t_{0.025}$$

The area to the right of $t_{0.025}$ is 0.025, and the area to the left of $t_{0.025}$ is $1 - 0.025 = 0.975$

$$t_{\frac{\alpha}{2}} = t_{0.025} = 2.14 \text{ using invT}(.975, 14) \text{ on the TI-84+ calculator.}$$

$$EBM = \left(t_{\frac{\alpha}{2}} \right) \left(\frac{s}{\sqrt{n}} \right)$$

$$EBM = (2.14) \left(\frac{1.6722}{\sqrt{15}} \right) = 0.924$$

$$\bar{x} - EBM = 8.2267 - 0.9240 = 7.3$$

$$\bar{x} + EBM = 8.2267 + 0.9240 = 9.15$$

The 95% confidence interval is (7.30, 9.15).

We estimate with 95% confidence that the true population mean sensory rate is between 7.30 and 9.15.

Solution



USING THE TI-83, 83+, 84, 84+ CALCULATOR

Press STAT and arrow over to TESTS.

Arrow down to 8: TInterval and press ENTER (or you can just press 8).

Arrow to Data and press ENTER.

Arrow down to List and enter the list name where you put the data.