Confidence Interval Worksheet

(*) See problem below.

SETUP (find these values in the problem):

1- Starting Standard Deviation: → σ = 1.8

2- Confidence Level: → c = 0.95 ← (as decimal)

3- Sample Mean: → $\bar{x}$ = 15.6

4- Sample Size: → n = 90

CALCULATIONS

1 - Find NEW Standard Deviation: → $= \frac{\sigma}{\sqrt{n}} = \frac{1.8}{\sqrt{90}} =$ 0.18973666

2- Find "Excluded Area": → $\frac{1-c}{2} = \frac{1-0.95}{2} = 0.025$

3- Left Endpoint = → NORM.INV(Excluded Area, $\bar{x}$, NEW SD)

NORM.INV(0.025, 15.6, 0.1897)

= 15.22819483

4- Right Endpoint = →

NORM.INV(Excluded Area + C, $\bar{x}$, NEW SD)

NORM.INV(0.975, 15.6, 0.1897)

= 15.97180517

Confidence Interval : [15.22, 15.97]

Example (from Brase and Brase 5th Ed):

Julia enjoys jogging. She has been jogging over a period of several years, during which time her physical condition has remained constantly good. Usually, she jogs 2 miles per day. The standard deviation of her times is $\sigma = 1.80$ minutes. During the past year, Julia has recorded her times to run 2 miles. She has a random sample of 90 of these times. For these 90 times, the mean was $\bar{x} = 15.60$ minutes. Let μ be the mean jogging time for the entire distribution of Julia's 2-mile running times (taken over the past year). Find a 0.95 confidence interval for μ.