Confidence Interval Worksheet

October 2026

The General Clinton Canoe Regatta is one of the longest canoe races in America. It is 63-miles long and takes several hours to complete. It's actually so long, racers often have "pit crews" at different points along the river. We are going to get a sense of the average time it takes these racers to complete the race.

Our random sample of 150 canoes had an average finish time for the 2025 Regatta of 9.02 hours. The population variance σ^2 is known to be 1.75 hours^2.

For this worksheet, we will assume we have passed all of our assumptions. Below is the z-values for different confidence levels as well as the confidence interval formula.

Conf. Level	99%	95%	90%	80%
Z*	2.58	1.96	1.645	1.28

$$\bar{x} \pm z^* \sqrt{\frac{\sigma^2}{n}}$$

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1. Please build a 95% confidence interval for the mean time to complete the race. The required pieces for the formula are given in the table and the middle paragraph above.

2. Please interpret your confidence interval

3. Please calculate a 99% confidence interval for the mean finish time.

4. What changed between the two intervals?

5. Please calculate another 95% confidence interval but this time assume our sample size doubled to 300.

6. Please calculate another 95% confidence interval but this time assume our sample size quadrupled to 600.

7. How do the widths of the three confidence intervals change?

8. Please calculate a 95% confidence interval but assume the mean is 8.5.

9. Please comment on how the confidence interval changes. Focus on both the width of the interval and it's location.

10. Finish the sentences below based on your solutions above.

    "If the confidence level increases, the width of the confidence interval will ....."

    "If the sample size increases, the width of the confidence interval will ....."

    "If the sample size increases by a factor of 4, the width of the confidence interval will ....."

    "If the sample mean increases, the width of the confidence interval will ....."

    "If the sample mean increases, the *location* (middle) of the confidence interval will ....."