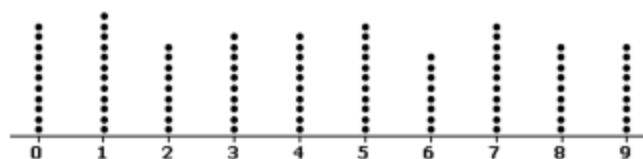


2. Expressing Confidence Intervals Example 2 showed how the statistics of $n = 22$ and $s = 14.3$ result in this 95% confidence interval estimate of σ : $11.0 < \sigma < 20.4$. That confidence interval can also be expressed as $(11.0, 20.4)$, but it cannot be expressed as 15.7 ± 4.7 . Given that 15.7 ± 4.7 results in values of 11.0 and 20.4, why can't we express the confidence interval as 15.7 ± 4.7 ?

3. Pick 4 Lottery The dotplot below depicts individual digits selected in the Pick 4 lottery from different states. Can the original list of individual sample digits be identified? Can the sample data be used to construct a 95% confidence interval estimate of the population standard deviation for all such digits? Why or why not?



4. Normality Requirement What is different about the normality requirement for a confidence interval estimate of σ and the normality requirement for a confidence interval estimate of μ ?

Finding Critical Values and Confidence Intervals. In Exercises 5–8, use the given information to find the number of degrees of freedom, the critical values χ_L^2 and χ_R^2 , and the confidence interval estimate of σ . The samples are from Appendix B and it is reasonable to assume that a simple random sample has been selected from a population with a normal distribution.

5. Nicotine in Menthol Cigarettes 99% confidence; $n = 25$, $s = 0.24$ mg.

6. Weights of Dollar Coins 99% confidence; $n = 20$, $s = 0.04111$ g.

7. Platelet Counts of Women 95% confidence; $n = 40$, $s = 65.2$.

8. Earthquake Magnitudes 95% confidence; $n = 50$, $s = 0.587$.

Finding Confidence Intervals. In Exercises 9–16, assume that each sample is a simple random sample obtained from a population with a normal distribution.

9. Mean Body Temperature Data Set 3 in Appendix B includes a sample of 106 body temperatures having a mean of 98.20°F and a standard deviation of 0.62°F . Construct a 90% confidence interval estimate of the standard deviation of the body temperatures for the entire population.

10. Chocolate Chip Cookies The Chapter Problem for Chapter 3 includes the numbers of chocolate chips in a sample of 40 Chips Ahoy regular cookies. The mean is 23.95 and the standard deviation is 2.55. Construct a 90% confidence interval estimate of the standard deviation of the numbers of chocolate chips in all such cookies.

11. Antifreeze A container of car antifreeze is supposed to hold 3785 mL of the liquid. Realizing that fluctuations are inevitable, the quality-control manager of the Taconic Chemical Company wants to be quite sure that the standard deviation is less than 30 mL. Otherwise, some containers would overflow while others would not have enough of the coolant. She selects a simple random sample of 24 containers and finds that the mean is 3789 mL and the standard deviation is 42.8 mL. Use these sample results to construct the 99% confidence interval for the true value of σ . Does this confidence interval suggest that the variation is at an acceptable level?