Suppose you administer a certain aptitude test to a random sample of 9 students in your school, and that the average score is 105. We want to determine the mean $\mu$ of the population of all students in the school. Assume a standard deviation of $\sigma = 15$ for the test.

1. What is the upper critical value for a 98% confidence interval? (Show the key numbers in the sketch of the distribution.)

2. Explain the meaning of "98% confident."

3. What is the standard deviation of the mean, $\sigma_x$?

4. Calculate a 98% confidence interval for the mean score $\mu$ for the whole school. Follow PAIS:

5. What sample size would be needed to have a margin of error at most 4 points?