

1. Let \bar{X} denote the mean of a random sample of n i.i.d. observations from a distribution that is $Normal(\mu, \sigma^2)$, $\sigma^2 > 0$, where σ is known but μ is unknown.

What is the probability that the confidence interval

$$(\bar{X} - 2.2 \frac{\sigma}{\sqrt{n}}, \bar{X} + 2.2 \frac{\sigma}{\sqrt{n}})$$

contains the (fixed) point μ ? (Note: this is not a trick question. μ is fixed, but you can think of the endpoints $\bar{X} \pm z \frac{\sigma}{\sqrt{n}}$ as *random*, forming a random interval that either contains μ or doesn't.)

2. Baron 9.7(a), p. 301. (Answer in back of book.)
3. Find a 95% confidence interval for μ , the true mean of a normal population which has a variance $\sigma^2 = 100$. Consider a sample of size 25 that has a mean of 69.3.
4. A department store has 10,000 customers' charge accounts. To establish the total amount owed by all its customers, it selected 36 accounts at random and found a mean of \$150 and a standard deviation of \$60.
 - (a) Establish a 95% confidence interval estimate of the mean amount owed by its customers. (They could then estimate the total owed on all charge accounts by multiplying by 10,000.)
 - (b) Provide an interpretation for this confidence interval to someone with little statistical background. (Hint: see p. 248.)
5. Find a 90% confidence interval for $\mu_1 - \mu_2$ when $n_1 = 30$, $n_2 = 39$, $\bar{x}_1 = 4.2$, $\bar{x}_2 = 3.4$, $s_1^2 = 49$, and $s_2^2 = 32$, where \bar{x}_1 is the mean of a sample of size n_1 from the first population (mean μ_1) and has sample variance s_1^2 , and \bar{x}_2 is the mean of a sample of size n_2 from the second population (mean μ_2) with sample variance s_2^2 .
6. Baron 9.9(a), p. 301. (Answer in back of book.)
7. Cranston, Rhode Island, has the reputation for selling the most expensive bubble gum in the U.S. Ten candy stores were surveyed and it was found that the average price in the 10 stores was 40 cents with a standard deviation of 5 cents. Find (a) a 95% and (b) a 99% confidence interval for μ , the mean gum price in Cranston.