

4.2

Question 4: Suppose someone handed you a sample of 10 values (instead of you generating it) and said, “I used a Gaussian distribution with mean of 0, but I don’t know the value of σ^2 I used except that it was greater than 2”. How would you use your results to assess their claim about the σ^2 used?

Their claim that their variance was greater than 2, seems highly unlikely based on the bootstrapping approach in this problem. With 10,000 samples, the bootstrap variance is consistently much smaller than 1. To be honest, mine is so small, at 0.025, that I do wonder if it’s correct, but it’s far below the estimate of “greater than 2” that the person in question 4 claimed.

Question 5: Find an equation (derivation not needed, but cite source) for the exact sampling distribution of S^2 and add it to the plot. Add to the title the mean and variance of this exact sampling distribution.

For the exact sampling distribution, I chose an equation for the gamma distribution:

https://www.probabilitycourse.com/chapter4/4_2_4_Gamma_distribution.php. The plot reflects this addition.