

04b Sample Examination Problems Chapter 6

1. Write down the expected value of the square of the mean of a random sample in terms of the population mean and variance, and use this result to display an unbiased estimate of the square of the population mean based on the square of the sample mean and the sample variance.

2. Explain why we must consider both bias and variance when judging the performance of an estimator.

3. Give two reasons why, for a sample of size 10, one might not wish to use the sample range divided by 3.078 to estimate the population standard deviation, even though this estimate is unbiased for a random sample from a normal distribution.

4. Define the mean squared error of an estimator.

5. What is an unbiased estimator?

6. The mean of a random sample is an unbiased estimator of the population mean. Why do we prefer the mean from a sample of size 20 to the mean of a sample of size 10 when estimating the population mean?