6. Two students at a large high school, Peter and Rania, wanted to estimate m, the mean number of soft drinks that a student at their school consumes in a week. A complete roster of the names and genders for the 2,000 students at their school was available. Peter selected a simple random sample of 100 students. Rania, knowing that 60 percent of the students at the school are female, selected a simple random sample of 60 females and an independent simple random sample of 40 males. Both asked all of the students in their samples how many soft drinks they typically consume in a week.

   (a) Describe a method Peter could have used to select a simple random sample of 100 students from the school.

Peter and Rania conducted their studies as described. Peter used the sample mean $\overline{X}$ as a point estimator for μ. Rania used $\overline{X}_{overall} = (0.6)\overline{X}_{female} + (0.4)\overline{X}_{male}$ as a point estimator for μ, where $\overline{X}_{female}$ is the mean of the sample of 60 females and $\overline{X}_{male}$ is the mean of the sample of 40 males. Summary statistics for Peter's data are shown in the table below.

Variable	N	Mean	Standard Deviation
Number of soft drinks	100	5.32	4.13

   (b) Based on the summary statistics, calculate the estimated standard deviation of the sampling distribution (sometimes called the standard error) of Peter's point estimator X.

Summary statistics for Rania's data are shown in the table below.

Variable	Gender	N	Mean	Standard Deviation
Number of Soft Drinks	**Female**	60	2.90	1.80
	Male	40	7.45	2.22

   (c) Based on the summary statistics, calculate the estimated standard deviation of the sampling distribution of Rania's point estimator $\overline{X}_{overall} = (0.6)\overline{X}_{female} + (0.4)\overline{X}_{male}$.