

Lesson 6: Sampling Distributions of the Sample Mean; Central Limit Theorem

Homework

Solutions

Please note that the steps show rounded numbers, but that the final answers to the problems are calculated without rounding.

Problem	Part	Solution
1	-	a: The Central Limit Theorem describes what happens to the shape of the distribution of sample means, when the sample size is large. The Law of Large Numbers describes what happens to the spread of the distribution of sample means, when the sample size is large.
2	-	c. If the sample size is large, the sample mean \bar{x} will be close to the population mean μ .
3	-	a. Skewed Right
4	-	30 hours
5	-	2 hours
6	-	b. Normal
7	-	30 hours
8	-	0.4 hours
9	-	b. Normal
10	-	266 days
11	-	2.921 days
12	-	Equal to
13	-	less than
14	-	The CLT tells us that the distribution of all possible sample means will have a normal distribution if the sample size we choose is large (typically 30 will be large enough, but not always).
15	-	The LLN tells us that if we have a simple random sample, the sample mean will be close to μ if the sample size is large. This is why we want to collect as much data as we can. The more data we collect, the closer \bar{x} will be to μ (if you have a simple random sample).