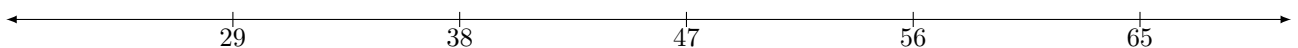**Stat 171 - Worksheet for Section 5.4**

Name: _____

1. You write the population values $\{1, 3, 5\}$ on slips of paper and and put them in a box. Then you randomly choose two slips of paper, with replacement. List all possible sample sizes of size $n = 2$. Calculate the mean of each sample. Find the mean, variance, and standard deviation of the sample means. Compare your results with the mean $\mu = 3$, variance $\sigma^2 = 8/3$ and standard deviation $\sigma \approx 1.633$ of the population.

2. Cellphone bills for residents of a city have a mean of \$47 and a standard deviation of \$9. Random samples of 64 cellphone bills are drawn from this population. Find the mean and and standard deviation of the sampling distribution of sample means. Then sketch a graph of the sampling distribution.

29　　　　　38　　　　　47　　　　　56　　　　　65

3. The diameters of fully grown white oak trees are normally distributed, with a mean of 3.5 feet and a standard deviation of 0.2 foot. Random samples of size 16 are drawn from this population, and the mean of each sample is determined. Find the mean and standard deviation of the sampling distribution of sample means. Then sketch a graph of the sampling distribution.

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 ◄─────┼──────────┼──────────┼──────────┼──────────┼──────────┼──────────┼─────►
      2.9        3.1        3.3        3.5        3.7        3.9        4.1
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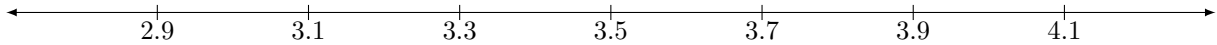
4. The average sales price of a single-family house in United States is $176,800. You randomly select 12 single-family houses. What is the probability that the mean sales price is more than $160,000? Assume that the sales prices are normally distributed with a standard deviation of $50,000.

5. A consumer price analyst claims that prices for LCD computer monitors are normally distributed, with a mean of $190 and a standard deviation of $48. What is the probability that a randomly selected computer monitor costs less than $200? You randomly select 10 LCD computer monitors. What is the probability that their mean cost is less than $200? Compare the two probabilities.