

Your Name: \_\_\_\_\_

Names of people you worked with: \_\_\_\_\_

**Instructions:** Work on this problem in class with your group. Do your best. This piece of paper will be collected during class.

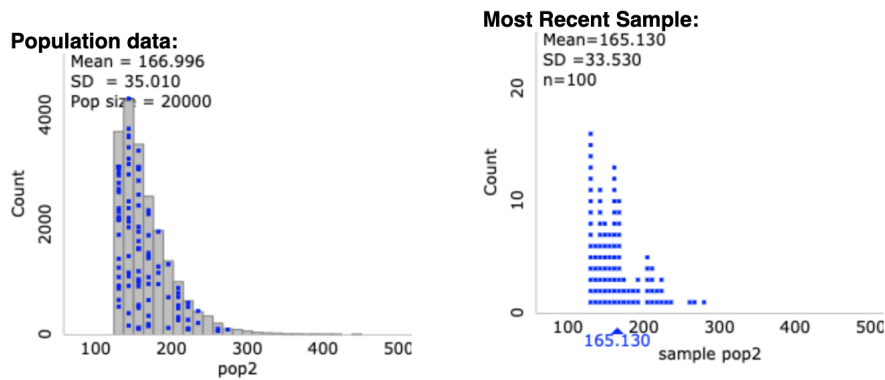
**Task:** Consider the Ethan Allen example. Recall that we are assuming that the CDC information on weights is reasonably accurate ( $\mu = 167\text{lbs}$  and  $\sigma = 35\text{lbs}$ ).

Roughly sketch three curves. For each curve, indicate at least three values (numbers) on the x-axis.

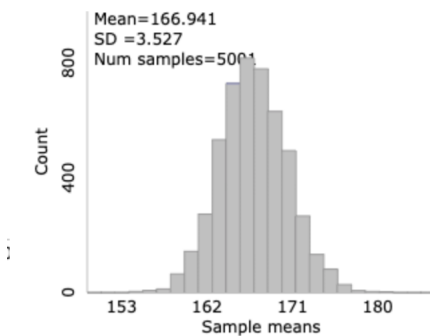
1. A histogram describing the weights of 100 randomly sampled individuals.
2. A histogram describing the sample means of 5000 difference samples, each sample of 100 random people.
3. A histogram describing the T-score of 5000 different samples (from a population of  $\mu = 167\text{lbs}$ ), each sample of 100 random people.

### Solution:

1. Likely the distribution is skewed right. The x-axis should have weights you would expect to see in the population.



2. The sampling distribution of the sample mean should be centered at 167lbs with a standard deviation of 3.5lbs. Pay attention to how much more narrow the sampling distribution of the mean is as compared to the population distribution or the data distribution.



3. The sampling distribution of the T score should be centered at 0 with a spread that is only slightly wider than a  $N(0,1)$ . Notice that the x-axis is no longer in units of "lbs". Instead, the x-axis is scaled, akin to using Z scores.

