Population

• Shape: Looks like a normal model.
• Center:
  – Mean, $\mu = 16$
• Spread:
  – Standard Deviation, $\sigma = 5$

Distribution of the Sample Mean, $\bar{y}$

• $n = 5$
• Shape: Normal model
• Center: Mean, $\mu = 16$
• Spread: Standard Deviation,
  $$SD(\bar{y}) = \frac{\sigma}{\sqrt{n}} = \frac{5}{\sqrt{5}} = 2.24$$

Summary

• Sampling from a population that follows a Normal Model.
• Distribution of the sample mean, $\bar{y}$
  – Shape: Normal model
  – Center: $\mu$
  – Spread: $SD(\bar{y}) = \frac{\sigma}{\sqrt{n}}$
Population

- Shape: Skewed right.
- Center:
  - Mean, $\mu = 8.08$
- Spread:
  - Standard Deviation, $\sigma = 6.22$

Distribution of the Sample Mean, $\bar{y}$

- $n = 5$
- Shape: Approximately normal
- Center: Mean, $\mu = 8.08$
- Spread: Standard Deviation, $\text{SD}(\bar{y}) = \frac{\sigma}{\sqrt{n}} = \frac{6.22}{\sqrt{5}} = 2.78$
Population

- Shape: Skewed right
- Center:
  - Mean, $\mu = 8.08$
- Spread:
  - Standard Deviation, $\sigma = 6.22$

Distribution of the Sample Mean, $\bar{y}$

- $n = 25$
- Shape: Approximately normal
- Center: Mean, $\mu = 8.08$
- Spread: Standard Deviation,
  $$SD(\bar{y}) = \frac{\sigma}{\sqrt{n}} = \frac{6.22}{\sqrt{25}} = 1.24$$
Central Limit Theorem

- When selecting random samples from a population with a distribution that is not normal, the distribution of the sample mean, \( \bar{y} \), will be approximately normally distributed.

Central Limit Theorem

- The larger the sample, the closer the distribution of the sample mean, \( \bar{y} \), is to being a normal model.

Summary

- Sampling from a population that does not follow a Normal Model.
- Distribution of the sample mean, \( \bar{y} \)
  - Shape: Approximately normal
  - Center: \( \mu \)
  - Spread: \( SD(\bar{y}) = \frac{\sigma}{\sqrt{n}} \)