

MATH 10 STUDY GUIDE: Chapters 7 & 8

CHAPTER 7: Confidence Intervals and Sample Size

- Confidence intervals – are you constructing an interval for a population **mean** or for a population **proportion**?
 - If it's an interval for a **mean**, is $n \geq 30$ or is σ (the *population* standard deviation) known?
 - If so, use the NORMAL DISTRIBUTION (z confidence interval)
 - If not, i.e. $n < 30$ and σ is unknown, use the t-DISTRIBUTION (t confidence interval)
 - Write the interval boundaries using the same number of decimal places that is given in the sample mean
 - If it's an interval for a **proportion**, use the NORMAL DISTRIBUTION (confidence interval for a proportion)
 - Write the interval boundaries accurate to 3 decimal places
- Sample size – is the question asking for a minimum sample size for an estimate of a population **mean** or a population **proportion**?
 - If it's a sample size regarding a **mean**, use:

$$n = \left(\frac{z_{\alpha/2} \cdot \sigma}{E} \right)^2$$

- If it's a sample size regarding a **proportion**, use:

$$n = \hat{p}\hat{q} \left(\frac{z_{\alpha/2}}{E} \right)^2$$

- Round up to the nearest **whole number** – the answer is a minimum sample size and a decimal answer does not make sense.

CHAPTER 8: Hypothesis Testing

- Does the question ask you to use the **traditional method** or the **P-value method**?
- Five steps for the **traditional method**:
 1. State the hypotheses and identify the claim.
 2. Find the critical value(s).
 3. Compute the test value.
 4. Make the decision to reject or not reject the null hypothesis by comparing the test value to the critical value.
Decision Rule: If the test value is **in** the critical region, **reject** H_0 .
If the test value is **not in** the critical region, **do not reject** H_0 .
 5. Summarize your results in terms of the claim.
- Five steps for the **P-value method**:
 1. State the hypotheses and identify the claim.
 2. Compute the test value.
 3. Find the P-value.
 4. Make the decision to reject or not reject the null hypothesis by comparing the P-value to the significance level α .
Decision Rule: If P-value $\leq \alpha$, **reject** H_0 .
If P-value $> \alpha$, **do not reject** H_0 .
 5. Summarize your results in terms of the claim.
- Is the question asking you to test a claim about a single population **mean** or a single population **proportion**?
 - If the claim is about a **mean**, is $n \geq 30$ or is σ (the *population* standard deviation) known?
 - If so, use the z test for means
 - If not, i.e. $n < 30$ and σ is unknown, use the t test for means
 - If the claim is about a **proportion**, use the z test for proportions.