

**Hypothesis Tests for Population Mean - m_x
Standardized Tests**

z – test:	t – test:
<ul style="list-style-type: none"> ▪ Population is <i>normally distributed</i> or sample size is large ($n \geq 30$). ▪ s_x is known 	<ul style="list-style-type: none"> ▪ Population is <i>normally distributed</i> or sample size is large ($n \geq 30$). ▪ s_x is <u>not</u> known
<p>Step 1. State the null and alternative hypotheses:</p> <p style="text-align: center;">Two-tail test: $H_0: m_x = m_0$ and $H_A: m_x \neq m_0$; One-tail tests: $H_0: m_x \geq m_0$ and $H_A: m_x < m_0$; or $H_0: m_x \leq m_0$ and $H_A: m_x > m_0$.</p>	
<p>Step 2. Choose the level of significance: α, the probability of making a Type I Error if H_0 is true.</p>	
<p>Step 3. Determine the critical values for the level of significance α,</p> <p style="text-align: center;">Two tail test: find $z_{(\alpha/2)}$ in the z-table. One tail test: find z_α or $-z_\alpha$ (These values are also in the t-table. Where?)</p> <p>Draw your test – illustrate the Non-Rejection and Rejection Regions.</p>	<p>Step 3. Determine the critical values for the level of significance α, and degrees of freedom = $(n - 1)$:</p> <p style="text-align: center;">Two tail test: find $t_{(\alpha/2)}$ in the t-table. One tail test: find t_α or $-t_\alpha$ in the t-table.</p> <p>Draw your test – illustrate the Non-Rejection and Rejection Regions.</p>
<p>Step 4: Estimate. Choose a sample: calculate \bar{X} - an estimate for m_x.</p> <p style="text-align: center;">Calculate the test statistic:</p> $z_{calc} = \frac{\bar{x} - m_0}{s_x} = \frac{\bar{x} - m_0}{s_x / \sqrt{n}}$	<p>Step 4: Estimate. Choose a sample: calculate \bar{X} - an estimate for m_x; and calculate s_x - an estimate for s_x.</p> <p style="text-align: center;">Calculate the test statistic:</p> $t_{calc} = \frac{\bar{x} - m_0}{s_x / \sqrt{n}}$
<p>Step 5. Compare the test statistic to the critical values. Where does your test statistic fall? Rejection or non-rejection region?</p>	<p>Step 5. Compare the test statistic to the critical values. Where does your test statistic fall? Rejection or non-rejection region?</p>
<p>Step 6. Write a conclusion. There are five things to include:</p> <ul style="list-style-type: none"> ▪ The level of significance α. ▪ Your conclusion – did you reject or fail to reject the null hypothesis? ▪ Sample information – what was the sample size? ▪ The null hypothesis – repeat the specific value used for the null hypothesis. ▪ The alternative hypotheses – was it a one (which tail) or two tail test? <p>If someone were to read your conclusion, they should understand completely how you conducted your test and what size sample you chose.</p>	