

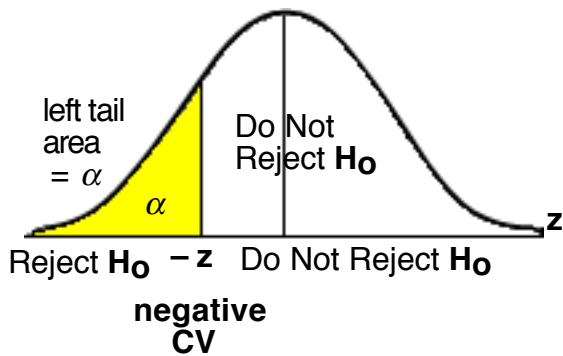
**Hypothesis Tests involving a claim about
the true value of a Population Mean μ_x
with the Population Standard Deviation σ_x Known**

Step 1: **Take a random sample value** of size > 30 or take a sample from a normal population. the **Population Standard Deviation σ_x is known** We use that value to compute the test statistic. Use a calculator to input the sample values and **find the sample mean.**

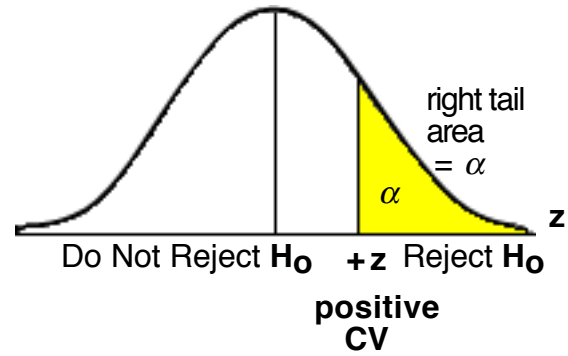
Step 2: State H_0 as an **equality** and H_1 as the alternate **inequality.**

Step 3: Decide the appropriate critical region(s) (One Tail Left, One Tail Right or Two Tail Left and Right) based on the significance level α

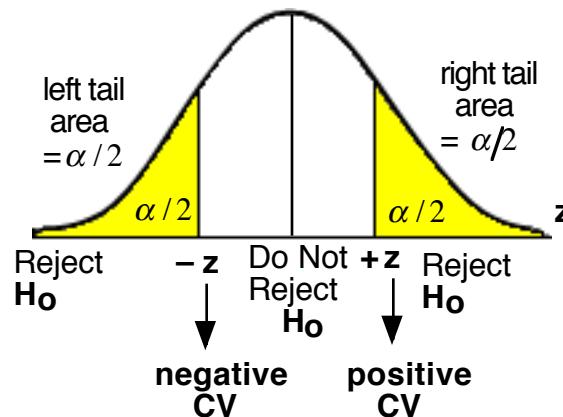
If H_1 is a **less than** statement
like $H_1 \mu_x < 2.7$
then the rejection region is in the **left tail**



If H_1 is a **greater than** statement
like $H_1 \mu_x > 2.7$
then the rejection region is in the **right tail**



If H_1 is a **not equal** statement like $H_1 \mu_x \neq 2.7$
then the rejection regions are in **the left and right tails.**

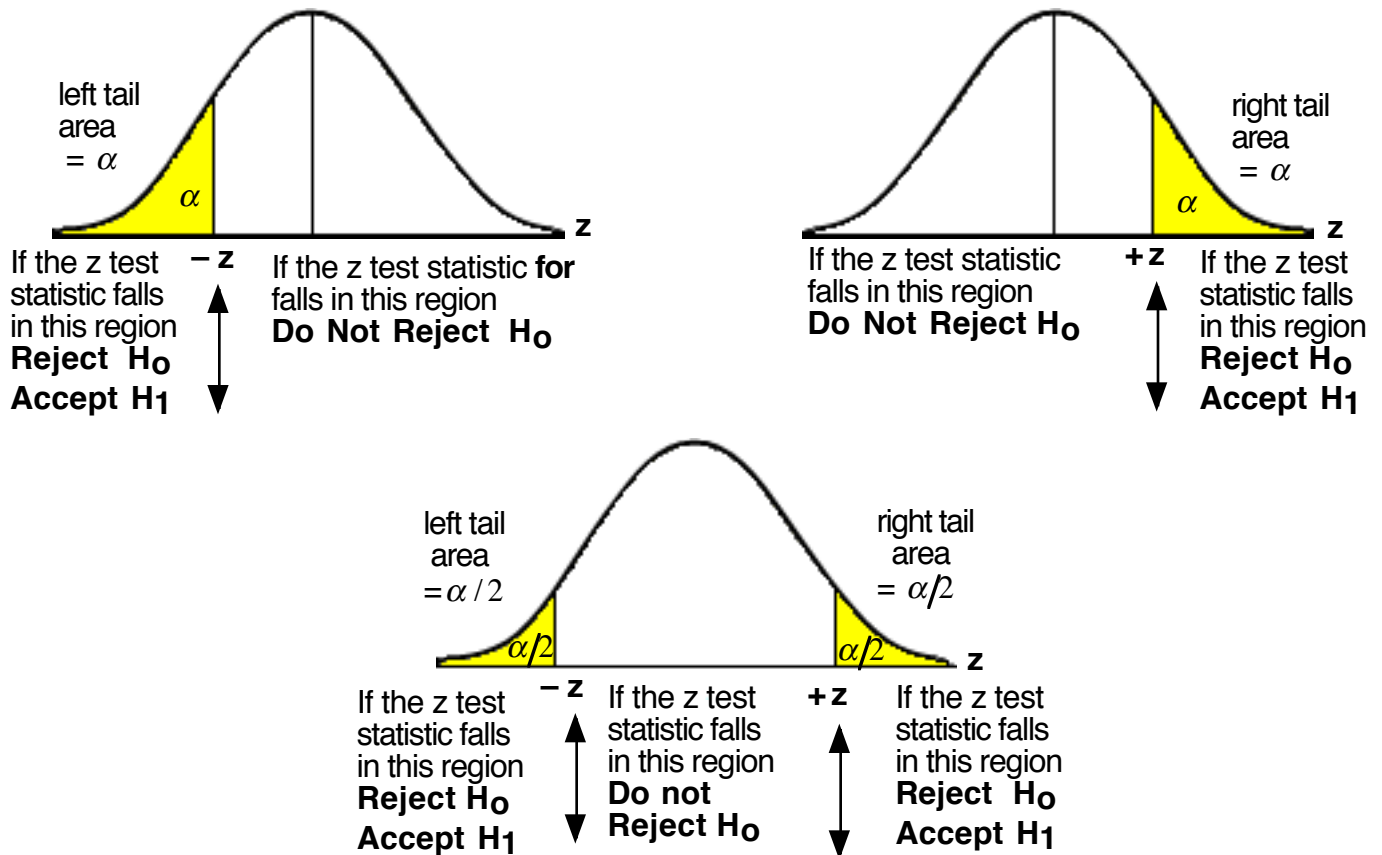


Step 4: **The z distribution is used to test claims about the population mean** if the population standard is known. Graph the standard normal z curve. Compute the critical z values and place them on the graph. Label the Reject and Do not Reject regions.

Step 5: Compute the value of the the z test statistic using the values stated in H_0 and H_1 . The **Population Standard Deviation is known** we will use that to compute the test statistic.

The **z Test Statistic** for the **Population Proportion** is:
$$z = \frac{(\bar{x} - \mu_x)}{\sigma_x}$$

Step 6: Decide if the test statistic falls into the Reject or DNR region. If the test statistic falls in the Rejection Region than **the difference** between the claimed value in H_0 and the sample value **is significantly large enough** to reject the H_0 claim of equality.



State a conclusion based on H_0 : Either **Reject H_0** or **Do Not Reject H_0**

Conclusion based on the problem:

Reject H_0

There is sufficient evidence at the α level to **support the claim of “inequality” in H_1**

Do Not Reject H_0

There is **not sufficient** evidence at the α level to reject the “statement of equality in H_0 ”

or

There is not sufficient evidence at the α level to support the “statement of inequality in H_1 ”