

Hypothesis Testing - Terminology

Term	Example	Definition
Null Hypothesis	<ul style="list-style-type: none"> “Dave did not commit the crime” “The drug does not have any effect” $H_0: \mu = 83$ 	The proposal that <i>everything is normal</i> or that <i>the thing you say is true</i> .
Alternate Hypothesis	<ul style="list-style-type: none"> “Dave committed the crime” “The drug does have an effect” $H_1: \mu < 83$ $H_1: \mu \neq 83$ 	The proposal that <i>everything is not normal</i> or that <i>the thing you say is false</i> .
One tailed test	<ul style="list-style-type: none"> “The drugs have a positive effect” $H_1: \mu < 83$ 	A test which involves testing only one end of a distribution.
Two tailed test	<ul style="list-style-type: none"> “The drugs have an effect, be it positive or negative” $H_1: \mu \neq 83$ 	A test which involves testing both ends of a distribution.
Test Statistic	$z = \frac{\bar{x} - 83}{\frac{10}{\sqrt{36}}} = 0.6(\bar{x} - 83)$	The parameter of the distribution on which the test is to be conducted, often based on \bar{x} .
Significance Level	<p style="text-align: center;">5%</p> <p>(5% significance level on a two tailed test is 2.5% at either end of the distribution)</p>	<p>The probability of the test statistic appearing in the critical region and, therefore...</p> <p>The probability of rejecting the null hypothesis when it may in fact be correct.</p>
Critical Region	<p>For a two tailed test, 5% significance level \Rightarrow</p> $z = \pm 1.96$ $ z > 1.96$	<p>The values of the test statistic which make up the tail(s) of the distribution as determined by the significance level.</p> <p>The region and values beyond which we consider it too unlikely to have occurred naturally and under the null hypothesis.</p>
Critical Value	$\bar{x} = 86.2 \Rightarrow z = 1.92$	The value of the sample statistic being compared to the critical region.
Type 1 error	<ul style="list-style-type: none"> Concluding that Dave is guilty when he is in fact innocent. A False positive. 	Rejecting H_0 (and accepting H_1) when it is in fact correct.
Type 2 error	<ul style="list-style-type: none"> Concluding that Dave is innocent when he is in fact guilty. 	Accepting H_0 (and rejecting H_1) when it is in fact not true.