

Summary of Hypothesis Test about a population mean: σ **Known**
[Standard Normal Table](#) (cumulative)

H_0 : Null Hypothesis, μ_0 = Hypothesized mean, σ = Population standard deviation

	Two-Tailed Test	Lower Tail Test	Upper Tail Test
Hypothesis	$H_0 : \mu = \mu_0$ $H_a : \mu \neq \mu_0$	$H_0 : \mu = \mu_0$ $H_a : \mu < \mu_0$	$H_0 : \mu = \mu_0$ $H_a : \mu > \mu_0$
Test Statistic	$z\text{-test} = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$	$z\text{-test} = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$	$z\text{-test} = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$
Rejection Rule: <i>p</i> -Value approach	Reject H_0 : if $p\text{-value} \leq \alpha$	Reject H_0 : if $p\text{-value} \leq \alpha$	Reject H_0 : if $p\text{-value} \leq \alpha$
Rejection Rule: Critical Value	Reject H_0 : if $z\text{-test} \leq -z_{\alpha/2}$ or $z\text{-test} \geq z_{\alpha/2}$	Reject H_0 : if $z\text{-test} \leq -z_{\alpha}$	Reject H_0 : if $z\text{-test} \geq z_{\alpha}$
Example: $\alpha = 0.05$	Reject if $p\text{-value} \leq 0.05$ or $1.96 \leq z\text{-test} \leq -1.96$	Reject if $p\text{-value} \leq 0.05$ or $z\text{-test} \leq -1.645$	Reject if $p\text{-value} \leq 0.05$ or $z\text{-test} \geq 1.645$
Example: $\alpha = 0.01$	Reject if $p\text{-value} \leq 0.01$ or $2.58 \leq z\text{-test} \leq -2.58$	Reject if $p\text{-value} \leq 0.01$ or $z\text{-test} \leq -2.33$	Reject if $p\text{-value} \leq 0.01$ or $z\text{-test} \geq 2.33$
Standard Normal Example $\alpha = 0.05$			

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