Summary for Section 7.3 ($σ$ is known)

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| CLT for $\overbar{x}$ | C.I. = Confidence Interval | Sample size n |
| n > 30OrThe population distribution is bell shaped to start with.The C.L.T. for $\overbar{x}$ says:The sampling distribution for $\overbar{x}$ will be bell shaped with:$μ\left(\overbar{x}\right)$ = $μ$$σ\left(\overbar{x}\right)$ = $\frac{σ}{\sqrt{n}}$$σ\left(\overbar{x}\right)$ = the standard deviation of $\overbar{x}$ s. = the standard error of the mean. | $μ$ = Best Estimate $\pm Error$Best Estimate = $\overbar{x}$Error = $Z\_{^{α}/\_{2}}\frac{σ}{\sqrt{n}}$So $ μ=$ $\overbar{X}$ $\pm $ $Z\_{^{α}/\_{2}}\frac{σ}{\sqrt{n}}$Example: $μ$ = 180 $\pm $ 5Best Estimate = $\overbar{X}$ = 180Error = 5C.I. is $ μ \in \left[175,185\right]$C.I. is $ μ \in $ [L , U] | You need a C.I. with high confidence (which means a specified level of confidence) and a small error (which means a specified E).So the question boils down to:How big the sample size should be to guarantee a high specified confidence and a small specified error.n = $\left(\frac{Z\_{^{α}/\_{2}} σ}{E}\right)^{2}$When computing the sample size n, you always round up. |



Summary for Section 7.3 ($σ$ is unknown)

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| CLT for $\overbar{x}$ | C.I. = Confidence Interval | Sample size n |
| n > 30OrThe population distribution is bell shaped to start with.The C.L.T. for $\overbar{x}$ says:The sampling distribution for $\overbar{x}$ will be bell shaped with:$μ\left(\overbar{x}\right)$ = $μ$$σ\left(\overbar{x}\right)$ = $\frac{s}{\sqrt{n}}$$σ\left(\overbar{x}\right)$ = the standard deviation of $\overbar{x}$ s. = the standard error of the mean.S = Standard deviation of the sample.$\overbar{x}$ = Average of the sample. | $μ$ = Best Estimate $\pm Error$Best Estimate = $\overbar{x}$Error = $t\_{^{α}/\_{2}}\frac{s}{\sqrt{n}}$So $ μ=$ $\overbar{X}$ $\pm $ $t\_{^{α}/\_{2}}\frac{s}{\sqrt{n}}$ t stands for the student t distribution in reference to the Statistician William Sealy Gosset.The $t\_{^{α}/\_{2}}$ can be found from the TI or read from a table.Example: $μ$ = 180 $\pm $ 5Best Estimate = $\overbar{X}$ = 180Error = 5C.I. is $ μ \in \left[175,185\right]$C.I. is $ μ \in $ [L , U] | You will not have problems to compute the sample size needed when $σ$ is unknown |

