Central Limit Theorem "CLT"

When is a Sampling distribution Normal?

Central Limit Theorem

A sampling distribution for sample means or sample proportions will be normal if the sample size is sufficiently large.

More Data ⇒ Smaller Standard Error ⇒ More Normal

When is a Sampling distribution for Sample means normal?

* If population is skewed...
  Sample size must be at least 30 ($n \geq 30$)
* If population is normal...
  Sampling distribution will be normal also (even if $n < 30$)

Estimating Population Means: Sample Data should be normal or have a sample size (n) at least 30

When is a Sampling distribution for Sample proportions normal?

Must have at least 10 successes ($x \geq 10$) AND at least 10 failures ($n - x \geq 10$)

Example: Graduation %

* Sample data should have at least 10 graduates and at least 10 that did not graduate.
* What sample size should we use?
  Suppose population grad. rate = 0.275

(use Larger of these two)

$n = \frac{10}{\pi}$ or $n = \frac{10}{1-\pi}$

Why Does Sampling Distribution need to be normal?

Accuracy of formulas using the mean and Standard Error

Critical T and Z-scores

(For Sample size, Round up)

$n = \frac{10}{\pi} = \frac{10}{0.275}$

$= 36.3636 \approx 37$

$n = \frac{10}{(1-\pi)} = \frac{10}{(1-.275)}$

$= 13.7931 \approx 14$

We need sample size at least 37