$$P\left[-z_{\alpha/2} < \frac{\bar{X}-\mu}{\sigma/\sqrt{n}} < z_{\alpha/2}\right]$$

$\bar{X} \pm$

2A.

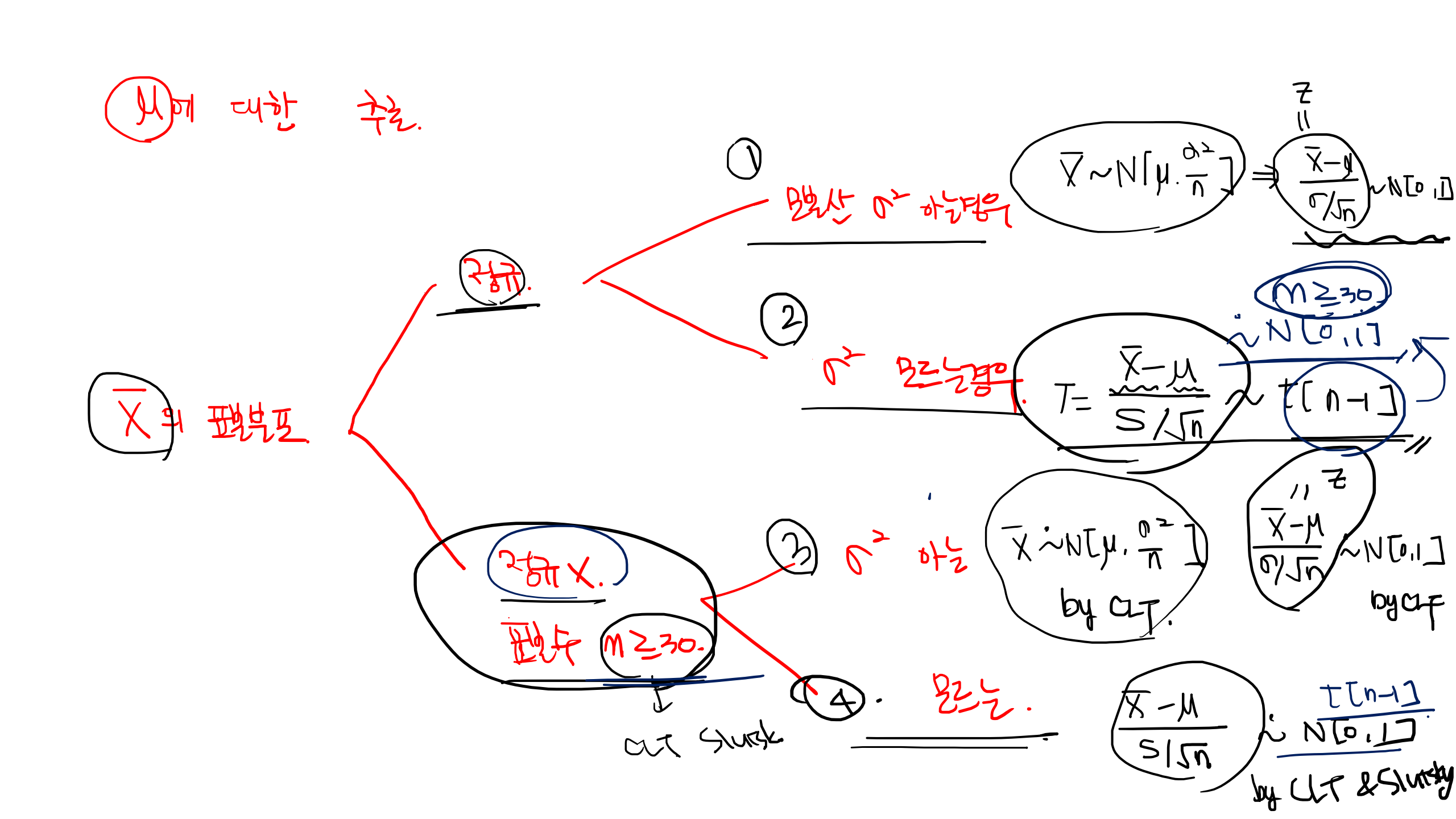
$$-z_{\alpha/2}\frac{\sigma}{\sqrt{n}} \leq \bar{X} - \mu \leq z_{\alpha/2}\frac{\sigma}{\sqrt{n}}$$

$$-\bar{X} - z_{\alpha/2}\frac{\sigma}{\sqrt{n}} \leq -\mu \leq -\bar{X} + z_{\alpha/2}\frac{\sigma}{\sqrt{n}}$$

$\bar{X} - \alpha$

$\bar{X} + \alpha$

$$P\left[\bar{X} - z_{\alpha/2}\frac{\sigma}{\sqrt{n}} \leq \mu \leq \bar{X} + z_{\alpha/2}\frac{\sigma}{\sqrt{n}}\right] = 1 - \alpha$$


μ에 대한 추론.
X̄의 표본분포
정규.
① 분산 σ² 아는경우
X̄ ~ N[μ, σ²/n] ⇒ Z = (X̄−μ)/(σ/√n) ~ N[0,1]
② σ² 모르는경우
T = (X̄−μ)/(S/√n) ~ t[n−1]
n≥30 ⇒ ~ N[0,1]
비정규 X.
표본수 n≥30.
CLT Slutsky
③ σ² 아는
X̄ ~ N[μ, σ²/n] by CLT.
Z = (X̄−μ)/(σ/√n) ~ N[0,1] by CLT
④ 모르는.
(X̄−μ)/(S/√n) ~ t[n−1] ~ N[0,1]
by CLT & Slutsky

(4)

$\frac{\bar{X}-\mu}{S/\sqrt{n}} \overset{\cdot}{\sim} N[0,1]$ by CLT & Slutsky thm

$S \xrightarrow{p} \sigma$

$\bar{X} \xrightarrow{p} \mu$

$\frac{\bar{X}-\mu}{S/\sqrt{n}} \overset{\cdot}{\sim} N[0,1]$ $n \to \infty$.

$\frac{\sigma}{S} \xrightarrow{p} 1$

$\frac{\bar{X}-\mu}{\sigma/\sqrt{n}} \xrightarrow{d} Z \sim N[0,1]$

$X \xrightarrow{p} a$

$Y \xrightarrow{d} Z$ $n \to \infty$

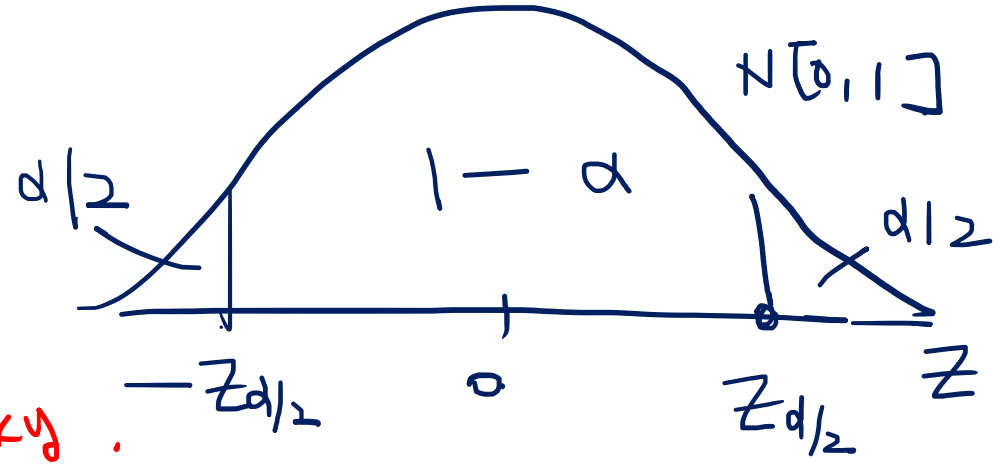
$N[0,1]$

$XY \xrightarrow{d} aZ$

$\frac{\sigma}{S} \cdot \frac{\bar{X}-\mu}{\sigma/\sqrt{n}} \overset{\cdot}{\sim} N[0,1]$

$$Z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} \approx N[0,1]$$

by CLT & Slutsky.



$$P\left[-Z_{\alpha/2} \le Z \le Z_{\alpha/2}\right] = 1-\alpha$$

$$P\left[\hat{p} - Z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \le p \le \hat{p} + Z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}\right] = 1-\alpha$$

$$-Z_{\alpha/2} < \frac{\bar{X}-\mu}{\sigma/\sqrt{n}} < Z_{\alpha/2}$$

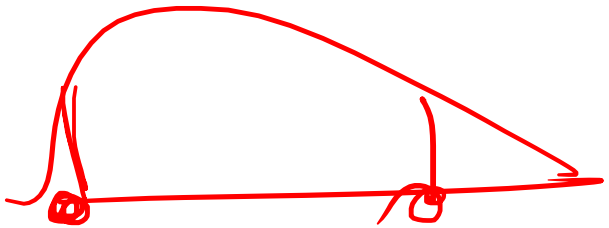
$$< \mu <$$

$$\le p \le$$

$\hat{p}, n, Z_{\alpha/2}$

$$P\left[a \le \frac{(n-1)S^2}{\sigma^2} \le b\right] = 1-\alpha$$

$$\frac{1}{b} \le \frac{\sigma^2}{(n-1)S^2} \le \frac{1}{a}.$$



$$P\left[\frac{(n-1)S^2}{\chi^2_{\alpha/2,n-1}} \le \sigma^2 \le \frac{(n-1)S^2}{\chi^2_{1-\alpha/2,n-1}}\right] = 1-\alpha$$