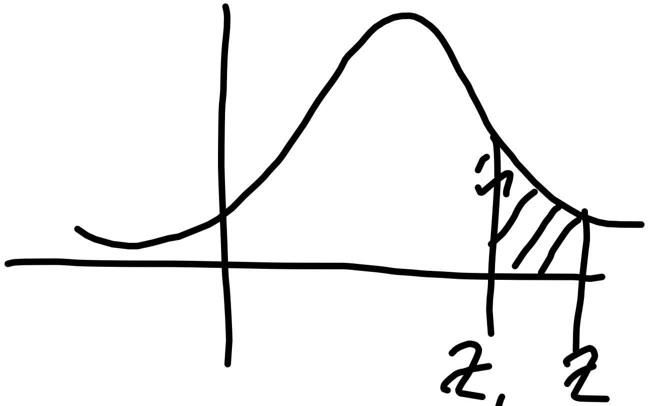
(1) a $z = \frac{x - \mu}{\sigma}$

$z_{143} = \frac{143 - 150}{10}$

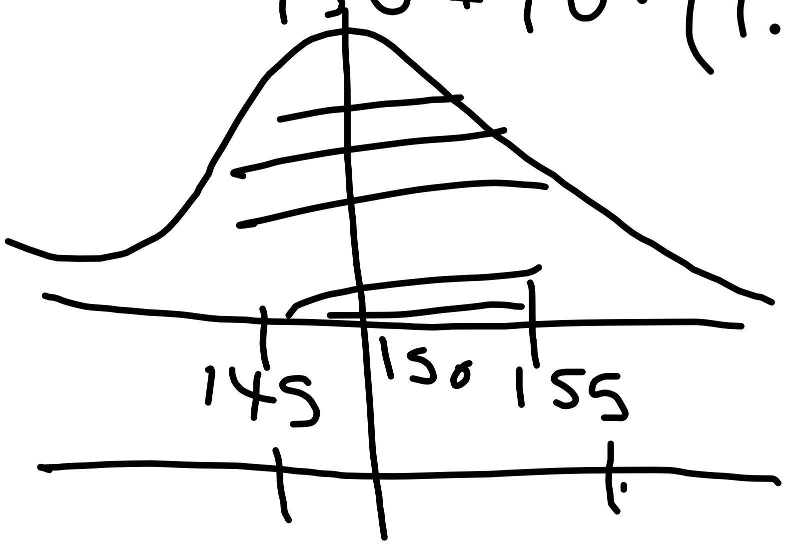


$x = \mu + z\sigma$

b

$= 150 + 10 \cdot (1.2)$

c



$$\hat{Y}_{INDIANA} = 10.304 + 0.343 X_{indiana}$$

$$= 10.34 + 0.343 \cdot 15.6$$

$$\text{Error} = \text{True} - \text{Pred}$$

$$= 15.9 - \hat{Y}_{indiana}$$

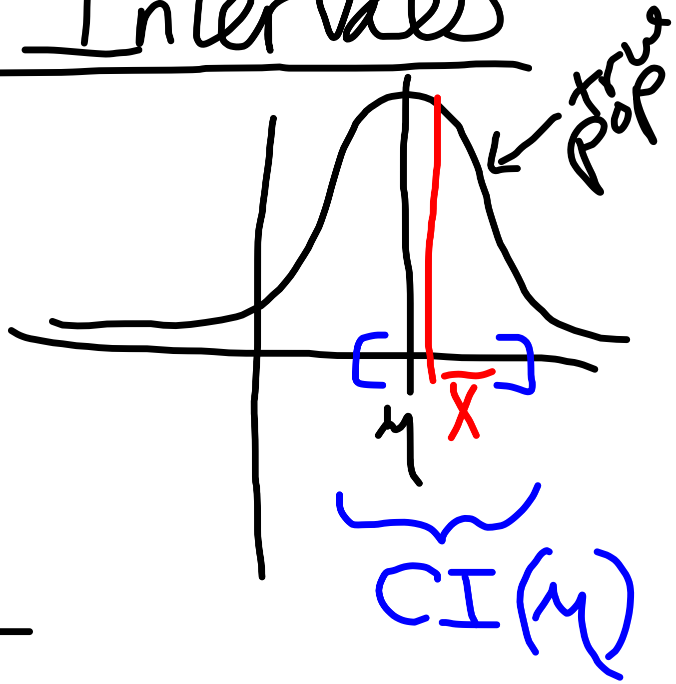
Confidence Intervals

$$z = \frac{X - \mu}{\sigma}$$

$$z_{\bar{x}} = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}}$$

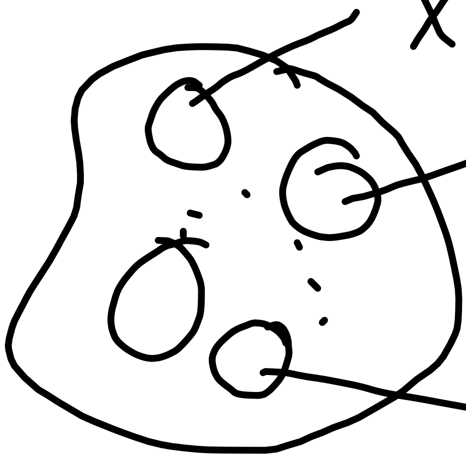
$$z_{\bar{x}}\sigma_{\bar{x}} = \bar{x} - \mu_{\bar{x}}$$

$$\boxed{\mu_{\bar{x}} = \bar{x} \pm z_{\bar{x}}\sigma_{\bar{x}}}$$



$$\mu_{\bar{x}} = \bar{x} \pm z_{\bar{x}}\,\sigma_{\bar{x}}$$

SE mean



$\bar{x}_1$

$\bar{x}_2$

$\bar{x}_1$

Total Pop

draw Samples $\rightarrow$ Compute mean of each Sample $\rightarrow$ Compute over all values $\bar{X}$ $\rightarrow$ SE mean

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}}$$

Now $\mu_{\bar{x}}$

$$CI(\mu_{\bar{x}}) = \bar{x} \pm z_{\bar{x}} \frac{\sigma_x}{\sqrt{n}}$$

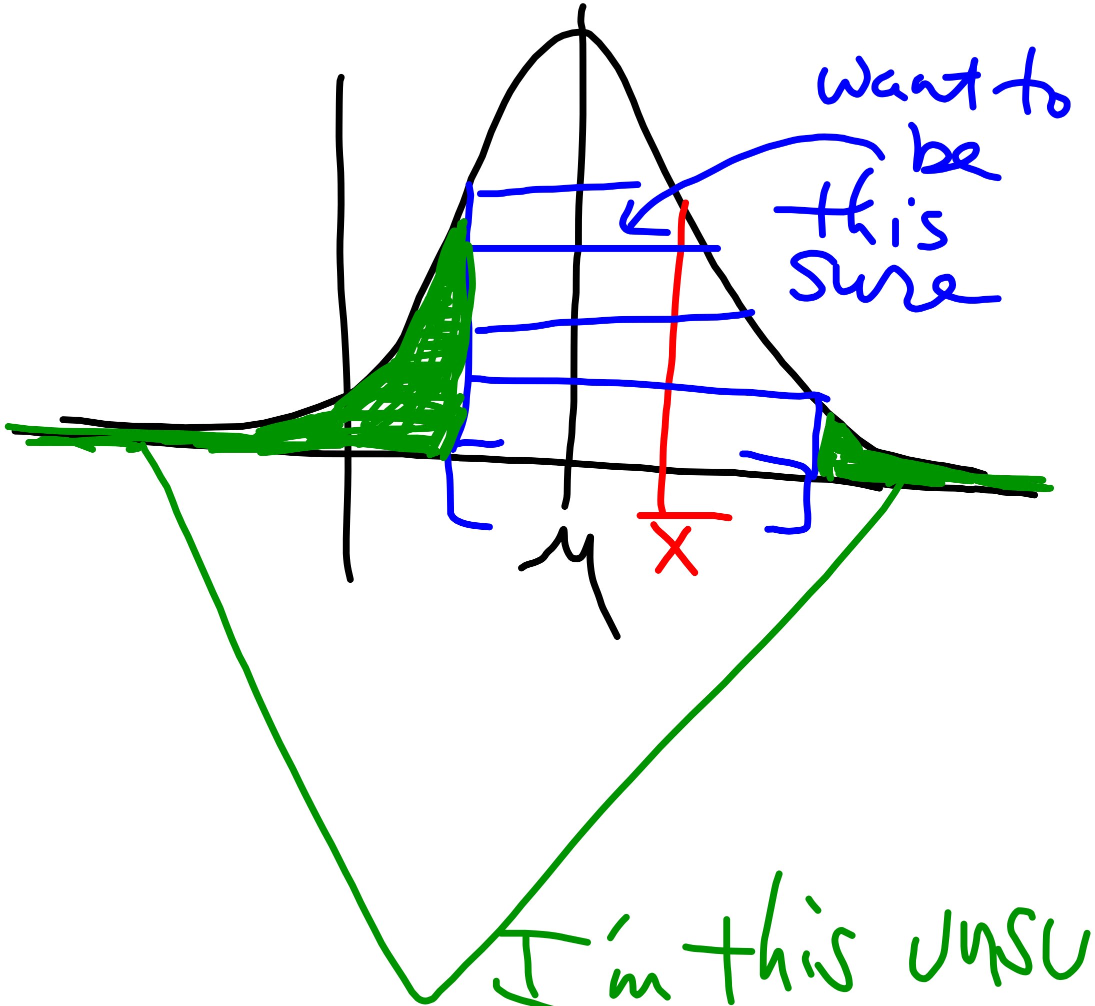
Can compute from data

Given

$$\sum_{i=1}^{n} \frac{x_i}{n}$$

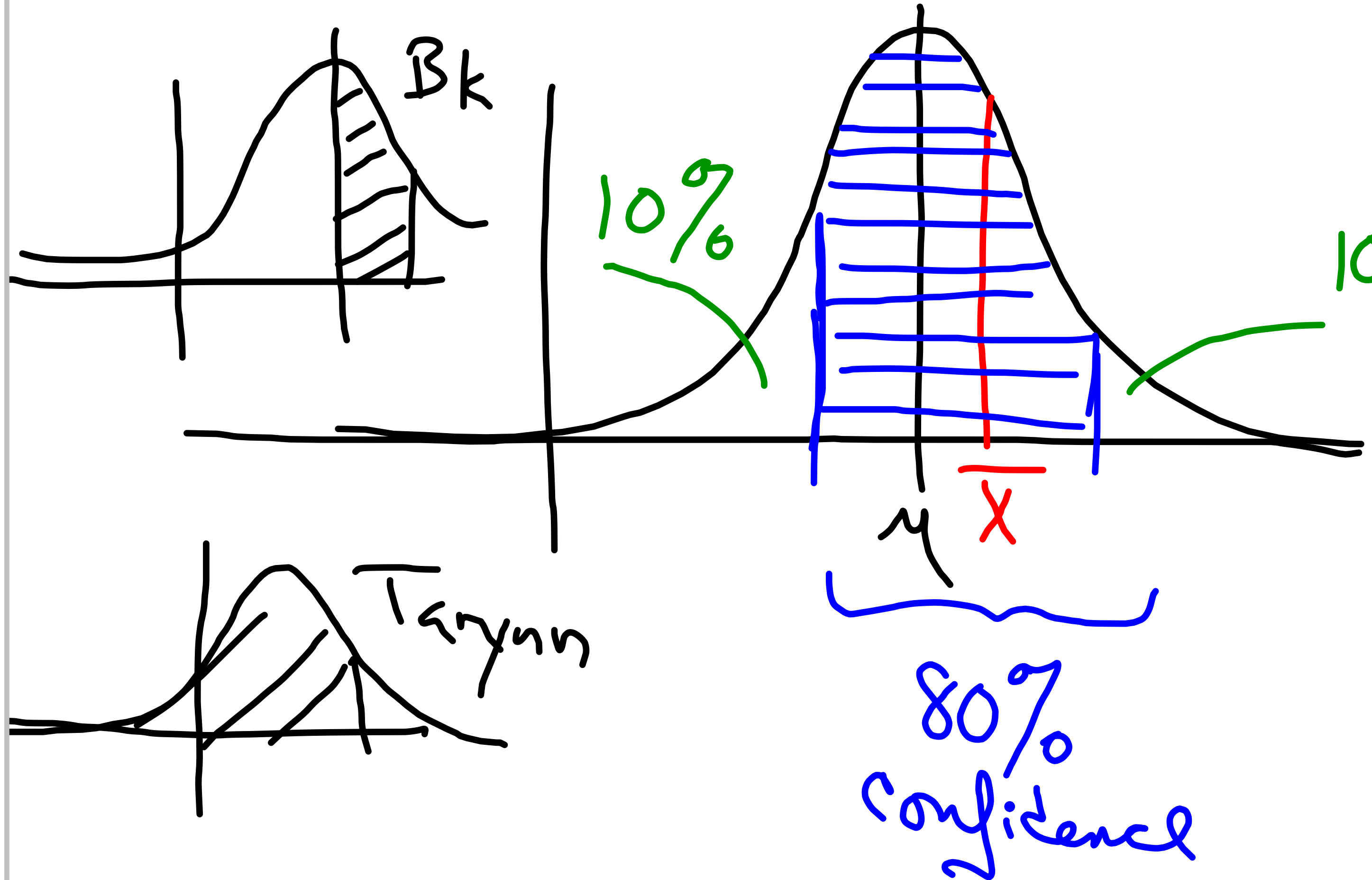
$$CI(\mu) = \bar{x} \pm z_{\bar{x}} \frac{\sigma_x}{\sqrt{n}}$$

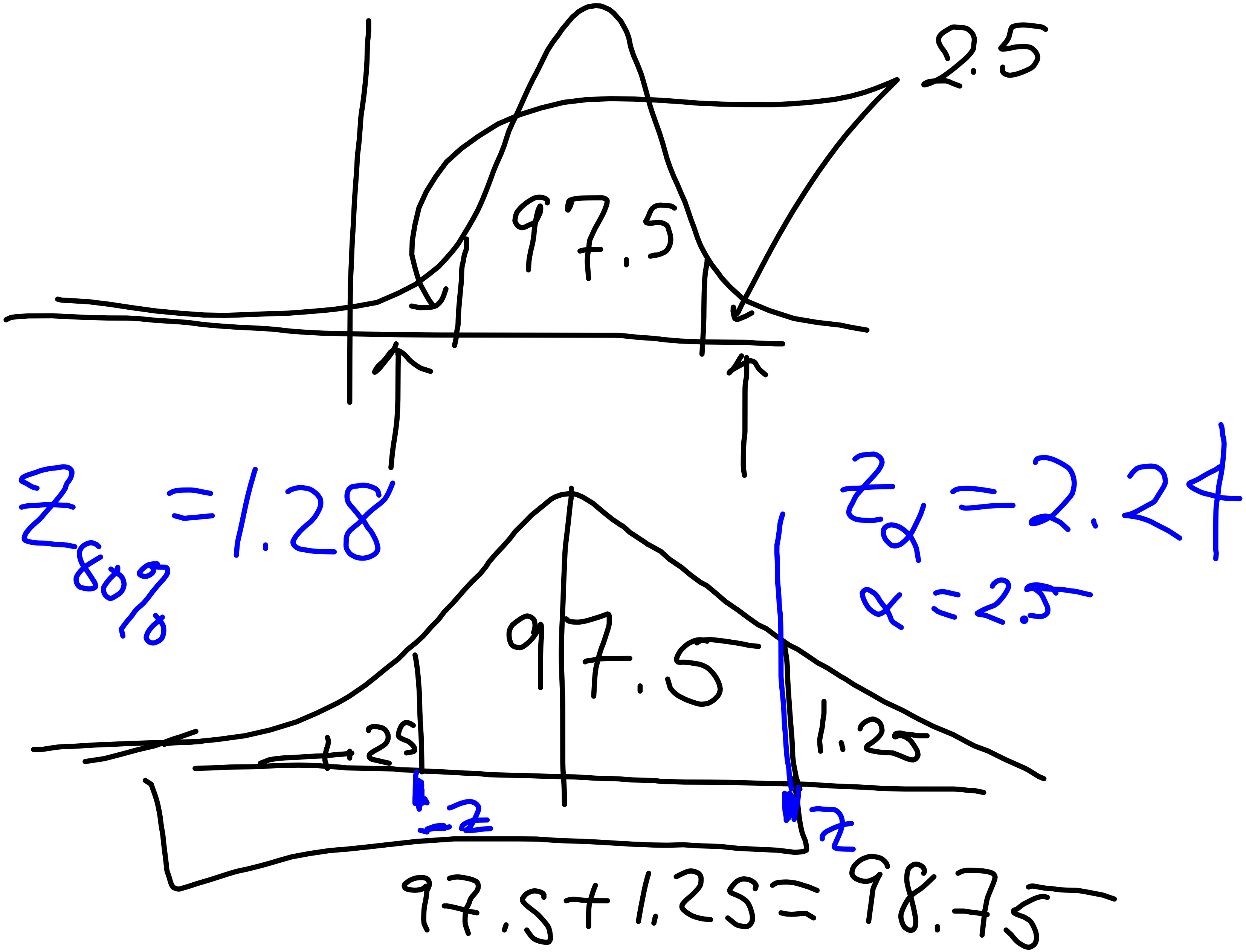
z value associate with how confident we want to be.



I'm this unsure $\equiv \alpha$

$$\star \longrightarrow \boxed{CI(\mu) = \bar{x} \pm z_\alpha \frac{\sigma_x}{\sqrt{n}}}$$




2.5
97.5
z80% = 1.28
zα = 2.24
α = 2.5
97.5
.25
1.25
-z
z
97.5 + 1.25 = 98.75