

Section 10.3

Want to know avg. tuition for
public in-state

unknown $\rightarrow \mu$

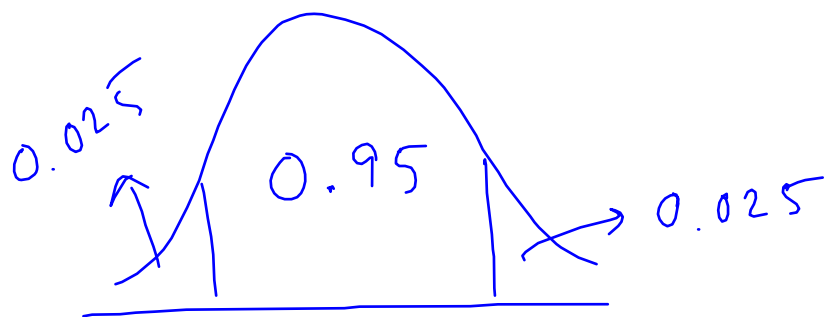
sample $\rightarrow \bar{x}$, $s \Rightarrow$ use t

$\bar{x} - E$, $\bar{x} + E$

$\sigma \rightarrow$ unknown

$\Rightarrow$ use z

$$E = t \cdot \frac{s}{\sqrt{n}}$$



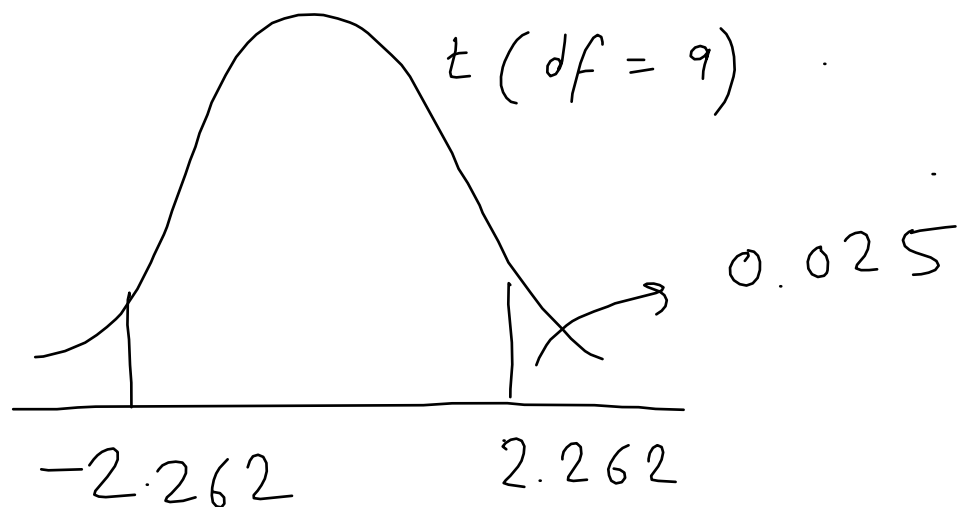
$$\bar{x} = 8841.3$$

$$s = 1813.31$$

$$n = 10$$

$$df = 9$$

$$t = 2.262$$



$$=T.INV(0.975, 9)$$

$$=T.INV.2T(0.05, 9)$$

$$E = 2.262 \times \frac{s}{\sqrt{10}}$$

$$= 1297.17$$

$$=CONFIDENCE.T(0.05, M3, 10)$$

$$CI = [7544.13, 10138.47]$$

What if we used z instead of t ?

↓
if $\sigma = 1813.31$

$$z = 1.96$$

$$E = 1.96 \times \frac{1813.31}{\sqrt{10}}$$

$$= 1123.9$$

$$CI : [7717.4, 9965.2]$$

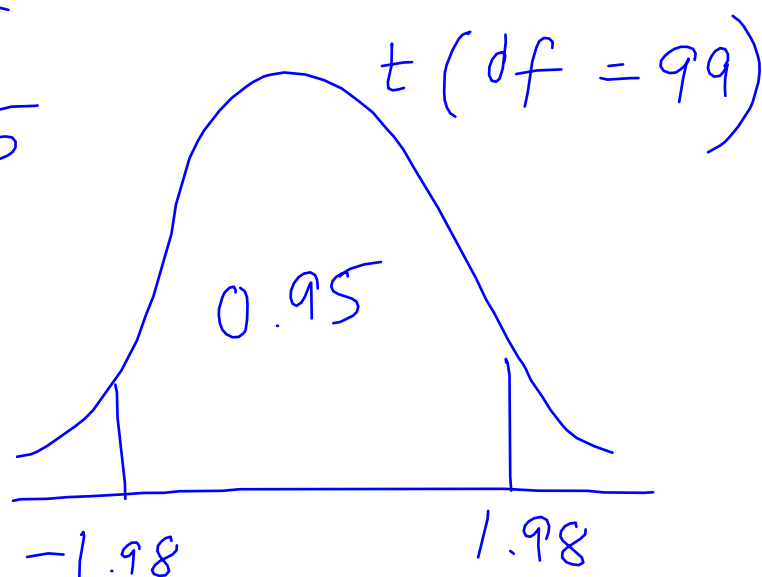
$$n = 100$$

$$\bar{x} = 8933.62$$

$$s = 2565.95$$

$$E = 1.98 \times \frac{s}{\sqrt{100}}$$

$$= 509.14$$



$$CI : [8424.48, 9442.76]$$

I want $E = 200$

$$E = t \cdot \frac{s}{\sqrt{n}}$$

$$\sqrt{n} = t \cdot \frac{s}{E} \quad \text{what should } n \text{ be?}$$

$$\approx 2 \cdot \frac{s}{E}$$

$$n = z^2 \cdot \frac{s^2}{E^2} \quad \text{if } \sigma \text{ unknown}$$

$$= z^2 \cdot \frac{\sigma^2}{E^2} \quad \text{if } \sigma \text{ known}$$

$$\bar{x} = 8933.62$$

$$s = 2565.95$$

$$E = 200$$

$$n = \left(z \cdot \frac{s}{E} \right)^2 \quad \text{if } 1 - \alpha = 0.95$$

$$z = 1.96$$

$$= \left(\frac{1.96 \times 2565.95}{200} \right)^2$$

$$= 632.34$$

$$\boxed{\text{Reqd. } n = 633}$$