

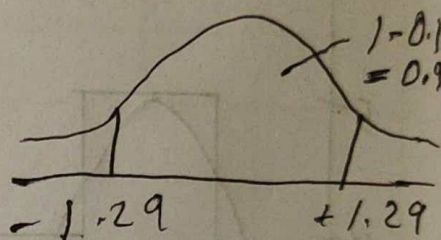
2) In a quant test of the CAT Exam the population standard deviation is known to be 100, A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean

$$\sigma = 100, \quad n = 25, \quad \bar{x} = 520$$

$$CI = 80\%$$

$$\alpha = 1 - 0.80 = 0.20$$

$$Z_{\frac{\alpha}{2}} = 1.29$$



$$\text{lower fence} = \bar{x} - Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

$$= 520 - 1.29 \frac{100}{\sqrt{25}}$$

$$= 520 - 1.29 \times 20$$

$$= 520 - 25.80$$

$$= 494.2$$

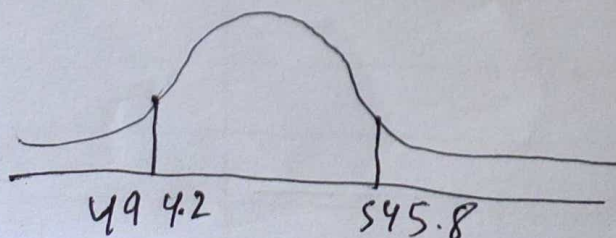
$$\text{higher fence} = \bar{x} + Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

$$\text{higher fence} = \bar{x} + Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

$$= 520 + 1.29 \frac{100}{\sqrt{25}}$$

$$= 520 + 25.80$$

$$= 545.8$$



3) A car that the percentage of citizens in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this he conduct a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owning a vehicle.

a) state null & alternative hypotheses

b) At a 10% significance level, is there enough evidence to support the idea that vehicle owners in city ABC city is 60% or less.

~~null hypothesis (H_0) = citizens in city ABC owns ~~at least~~ 60% or less vehicles~~

a) null hypothesis (H_0) = citizens in city ABC owns 60% or less vehicles

alternative hypothesis (H_1)

= citizens does not in city ABC does not owns 60% or less vehicles

$$b) \alpha = 0.10$$

$$CI = 0.90$$

	Yes	No
Observed	170	80
Expected	150	100

$$\text{Degree of freedom} = n - 1 = 2 - 1 = 1$$

Decision Boundary

$$= 2.706$$

If $\chi^2 > 2.706$ we Reject H_0

$$\chi^2 = \sum \frac{(F_o - F_e)^2}{F_e}$$

$$= \frac{(170 - 150)^2}{150} + \frac{(80 - 100)^2}{100}$$

$$= \frac{(20)^2}{150} + \frac{(-20)^2}{100}$$

$$= \frac{400}{150} + \frac{400}{100}$$

$$= \frac{32}{3} = 10.67$$

~~10.67~~ $10.67 > 2.706$, so we Reject the null hypothesis.

4) what is the value of 99.
percentile?

2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

$$\frac{99}{100} \times (n+1) \text{ percentile} \times \frac{100}{100} \times (n+1)$$

$$= \frac{99}{100} \times (20+1)$$

$$= \frac{99 \times 21}{100}$$

$$= 20.79$$

99 percentile value is 12