

Chapter 6 Renew pg 340 1-6

- 6.1
1. $n=30$ assume population S.D w $\sigma = 2.4$
 - a. Put all data in Calc to find $\bar{x} = 6.848$
 - b. Margin of error 95% CI use a z-interval

$$E = 1.96 \cdot \frac{2.4}{\sqrt{30}} = 0.859$$

c. you can use Calc z interval or

$$6.848 - 0.859 < \mu < 6.848 + 0.859$$

With a 95% Confidence, you can say the true population mean amount of time spent watching videos online is between 5.99 minutes and 7.71.

- 6.1 2. need to find min. Sample Size

$$n = \left(\frac{z_c \sigma}{E} \right)^2 \quad \begin{array}{l} E = 1 \text{ minute} \\ 99\% \quad z_c = 2.575 \\ \sigma = 2.4 \end{array}$$

$$n = \left(\frac{2.575 \cdot 2.4}{1} \right)^2 = 38.19 \Rightarrow 39$$

In order to be 99% Confident and w/i an error of 1 minute you would have to survey 39 people.

3. # 3 Starts w/ Lesson 6.2 because we don't know σ Put data in calculator (1 var stat)

a) $\bar{x} = 6.61$ $s_x = 3.38$

b) 90% Must use a t interval because no σ

$t_c = 1.833$ find Critical value from table d.f = 9

$$E = 1.833 \cdot \frac{3.38}{\sqrt{10}} = 1.959 \quad n=10$$

6.61 ± 1.959 or use calculator T interval

#3C Switches to a z interval because now we know $\sigma = 3.5$ min

by hand 90% CI $Z_c = 1.645$

$$E = 1.645 \cdot \frac{3.5}{\sqrt{10}} = 1.82$$

6.61 ± 1.82 or on calc Z interval

I am 90% confident that the mean time checker email is between 4.79 min and 8.43 min.

This Confidence Interval is more precise or narrower because you know σ you are more exact.

4. T interval because you do not know σ

$$\bar{x} = 31,721 \quad S_x = 5260 \quad n = 12$$

95%
d.f = 11

$$t_c = 2.201$$

table

$$E = 2.201 \frac{5260}{\sqrt{12}}$$

$$\$31,721 + \$3342$$

$$E = 3342.07$$

or on calc T -interval

I am 95% confident the true average earnings for a dental assistant is between \$28,379 and \$35,063 per year.

5. In a Survey $n = 1022$ $X = 779$ Yes or No??
Confidence Interval about Population Proportion

$$a. \hat{p} = \frac{779}{1022} = .762 \quad \hat{q} = .238$$

b. 90% CI for p $Z_c = 1.645$

$$E = Z_c \sqrt{\frac{\hat{p}\hat{q}}{n}} \quad E = 1.645 \sqrt{\frac{(.762)(.238)}{1022}} = .022$$

$$\hat{p} \pm .022 \quad .762 \pm .022$$

Or on Calculator

1Prop Z Interval

$$X = 779$$

$$n = 1022$$

C-level .90

I am 90% Confident the true proportion of Adults that think the U.S. should put more emphasis on domestic energy from solar power is between 74.0% and 78.4%.

c. Min Sample Size needed 99% Conf

$$E = .04$$

$$n = \hat{p}\hat{q} \left(\frac{Z_c}{E} \right)^2$$

$$n = (.762)(.238) \left(\frac{2.575}{.04} \right)^2 \approx 751.5 = 752$$

In order to be 99% confident within an error

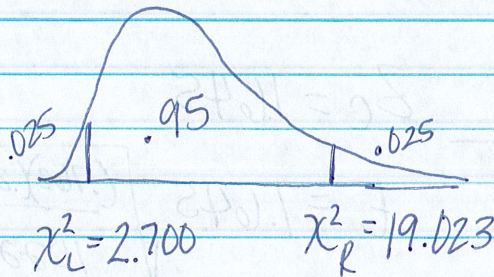
b. Use all Info from #3

$$\bar{X} = 6.61$$

$$S_x = 3.38 \quad S_x^2 = 11.424$$

$$n = 10 \quad d.f = 9$$

a) Construct a CI on pop Variance 95%



look at table to find

$$\chi^2_L \text{ \& \ } \chi^2_R$$

$$\frac{(n-1)S_x^2}{\chi^2_R} < \theta^2 < \frac{(n-1)S_x^2}{\chi^2_L}$$

$$\frac{9(11.424)}{19.023} < \theta^2 < \frac{9(11.424)}{2.700}$$

$$5.40 < \theta^2 < 38.08$$

I am 95% Confident the true pop variance is between 5.40 and 38.08 minutes

b) CI for the S.D θ

$$\sqrt{5.40} < \theta < \sqrt{38.08}$$

$$2.32 < \theta < 6.17$$

I am 95% Confident the true population standard deviation is between 2.32 ; 6.17 minutes.