4.5
10

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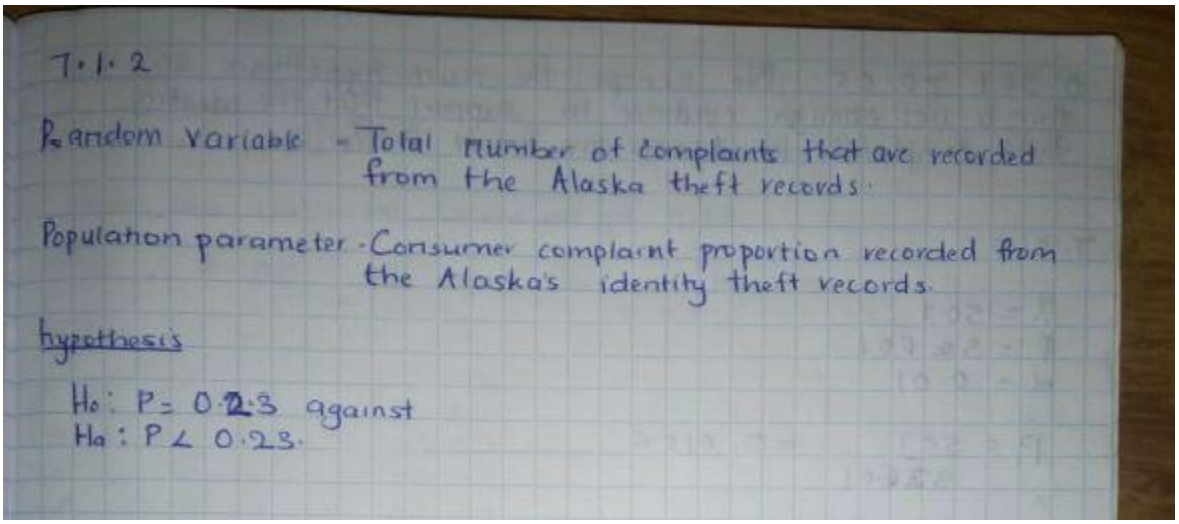
STAT 200 Week 5 Homework Problems

7.1.2

According to the February 2008 Federal Trade Commission report on consumer fraud and identity theft, 23% of all complaints in 2007 were for identity theft. In that year, Alaska had 321 complaints of identity theft out of 1,432 consumer complaints ("Consumer fraud and," 2008). Does this data provide enough evidence to show that Alaska had a lower proportion of identity theft than 23%? State the random variable, population parameter, and hypotheses.



7.1.6

According to the February 2008 Federal Trade Commission report on consumer fraud and identity theft, 23% of all complaints in 2007 were for identity theft. In that year, Alaska had 321 complaints of identity theft out of 1,432 consumer complaints ("Consumer fraud and," 2008). Does this data provide enough evidence to show that Alaska had a lower proportion of identity theft than 23%? State the type I and type II errors in this case, consequences of each error type for this situation, and the appropriate alpha level to use.

7.1.6

Type I error in this case would imply that the complaint proportion that involved identity theft in Alaska is less than 23% When the value is actually 23%. This would therefore result in the Federal Trade Commission perceiving identity theft as no problem when it actually is. fail to Reject

Type II error in this case is accepting that the complaints recorded 23% in 2007 involved identity theft when we actually to accept the alternate hypothesis. The effect of type II error is that the Federal Trade Commission would put too much effort to solve the identity theft issue than they actually should.

The appropriate alpha to use is 1%

7.2.4

According to the February 2008 Federal Trade Commission report on consumer fraud and identity theft, 23% of all complaints in 2007 were for identity theft. In that year, Alaska had 321 complaints of identity theft out of 1,432 consumer complaints ("Consumer fraud and," 2008). Does this data provide enough evidence to show that Alaska had a lower proportion of identity theft than 23%? Test at the 5% level.

7.2.4

let X be identity of theft complaints.
K be consumer complaints.

$X = 321$, $P = 23\% = 0.23$ $\alpha = 0.05$ $K = 1432$

$\hat{P} = X/K = 321/1432 = 0.22416 \simeq 0.2242 \simeq 0.22$ Don't Round too much

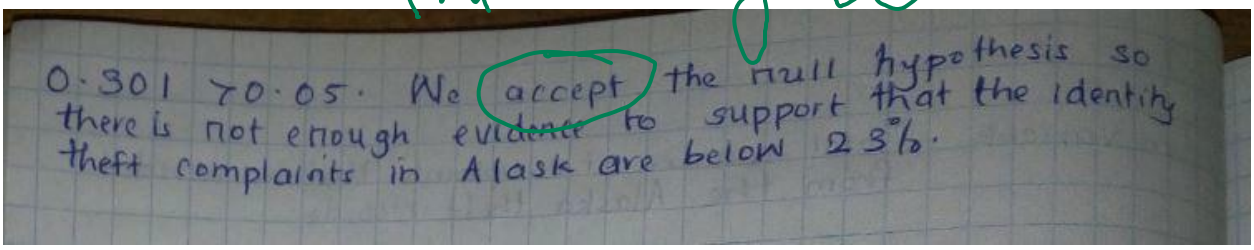
0.0112

$\mu_{\hat{p}} = 0.23$ $\sigma_{\hat{p}} = \sqrt{\frac{(0.23 \times 0.77)}{1432}} =$

$Z = \frac{(P - \hat{P})}{\sigma_{\hat{p}}}$ $Z = \frac{\bar{x} - \hat{\mu}}{\sigma_{\hat{p}}} = \frac{(0.22 - 0.23)}{0.01112} = 0.522$

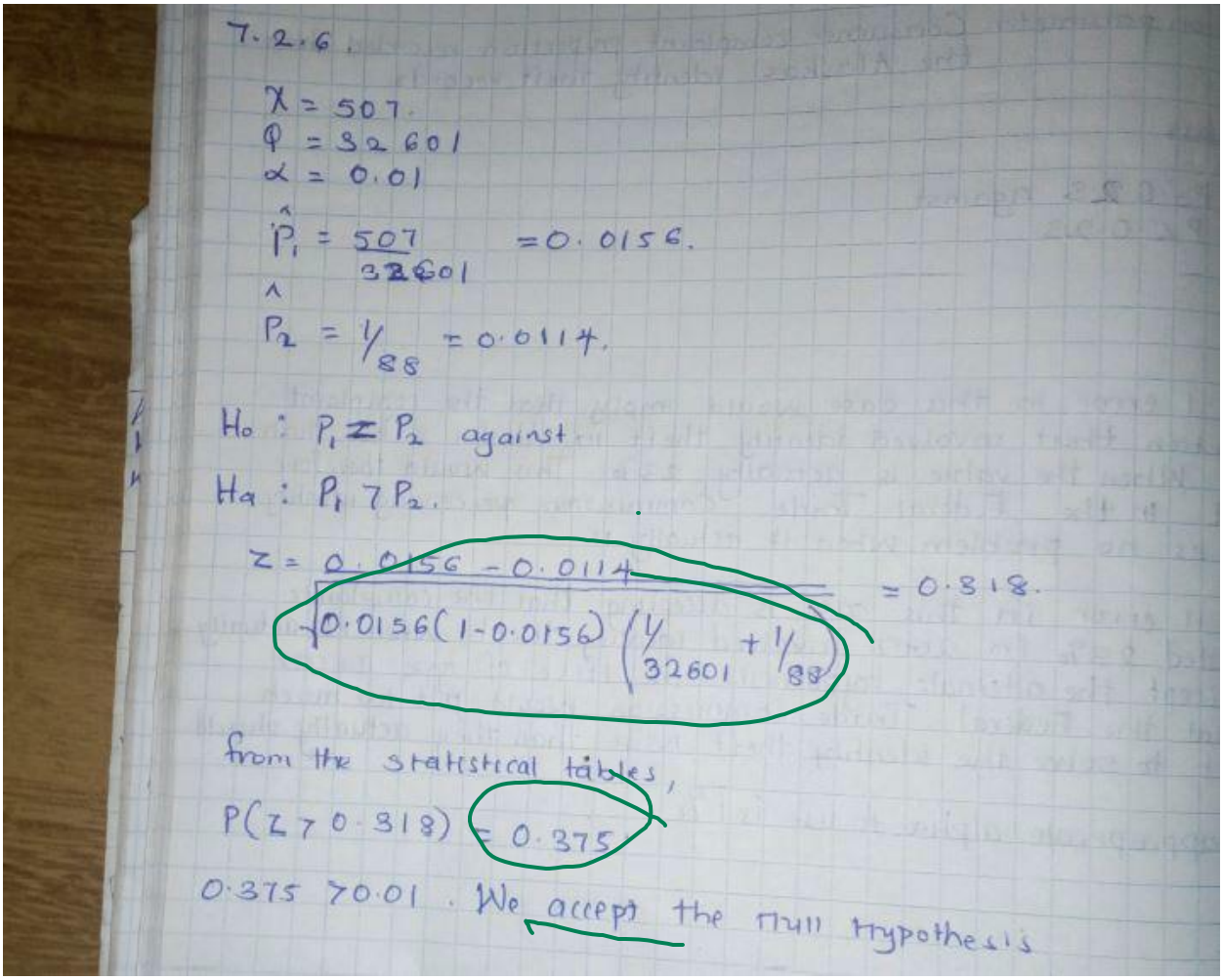
$Z_{tab} = 0.301$

fail to Reject



7.2.6

In 2008, there were 507 children in Arizona out of 32,601 who were diagnosed with Autism Spectrum Disorder (ASD) ("Autism and developmental," 2008). Nationally 1 in 88 children are diagnosed with ASD ("CDC features -," 2013). Is there sufficient data to show that the incident of ASD is more in Arizona than nationally? Test at the 1% level.

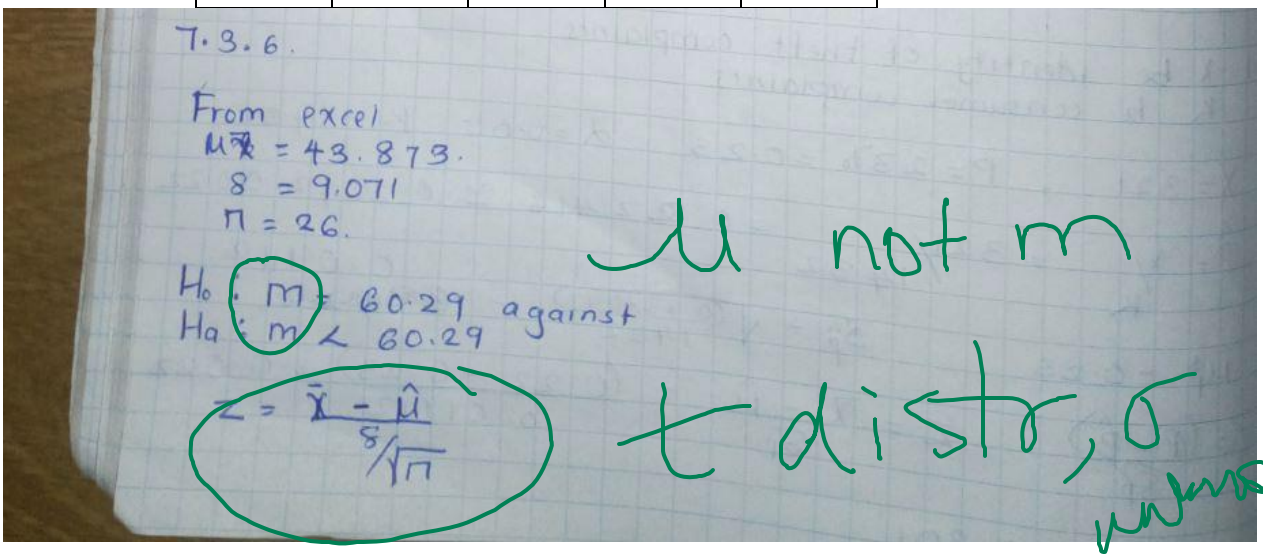


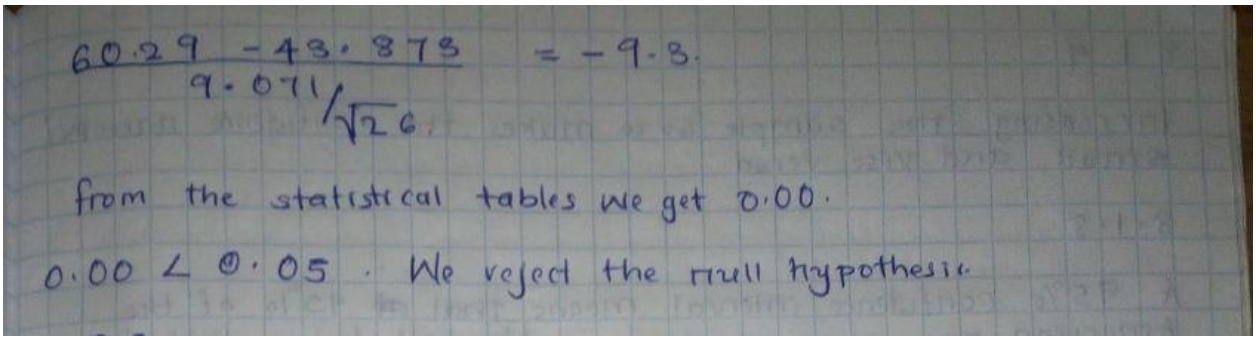
7.3.6

The economic dynamism, which is the index of productive growth in dollars for countries that are designated by the World Bank as middle-income are in table #7.3.8 ("SOCR data 2008," 2013). Countries that are considered high-income have a mean economic dynamism of 60.29. Do the data show that the mean economic dynamism of middle-income countries is less than the mean for high-income countries? Test at the 5% level.

Table #7.3.8: Economic Dynamism of Middle Income Countries

25.8057	37.4511	51.915	43.6952	47.8506	43.7178	58.0767
41.1648	38.0793	37.7251	39.6553	42.0265	48.6159	43.8555
49.1361	61.9281	41.9543	44.9346	46.0521	48.3652	43.6252
50.9866	59.1724	39.6282	33.6074	21.6643		



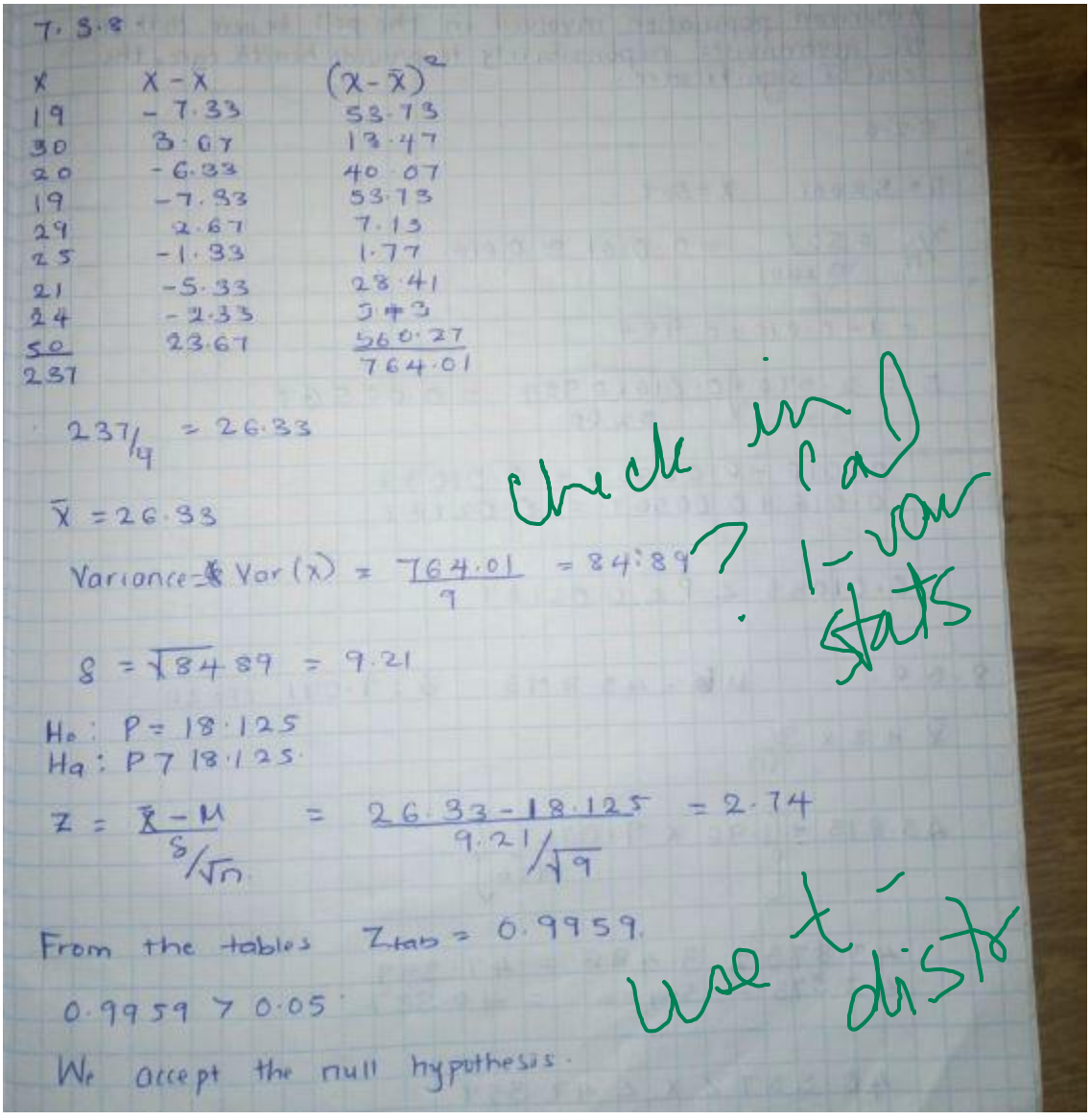


7.3.8

Maintaining your balance may get harder as you grow older. A study was conducted to see how steady the elderly is on their feet. They had the subjects stand on a force platform and have them react to a noise. The force platform then measured how much they swayed forward and backward, and the data is in table #7.3.10 ("Maintaining balance while," 2013). Do the data show that the elderly sway more than the mean forward sway of younger people, which is 18.125 mm? Test at the 5% level.

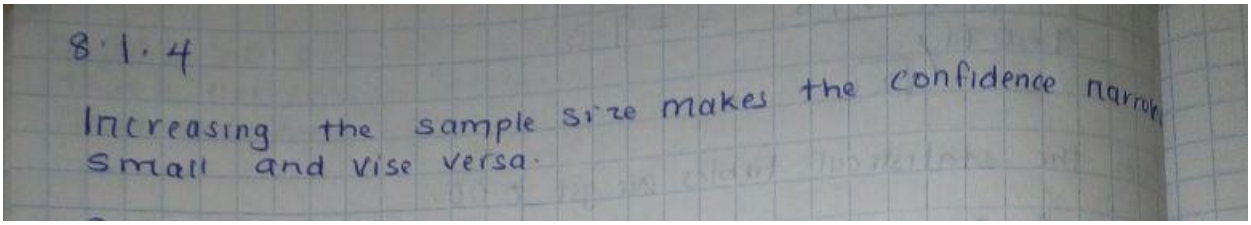
Table #7.3.10: Forward/backward Sway (in mm) of Elderly Subjects

19	30	20	19	29	25	21	24	50



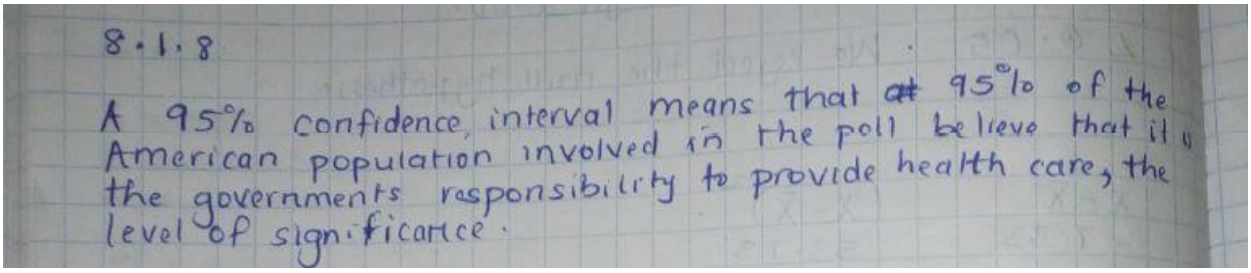
8.1.4

Suppose you compute a confidence interval with a sample size of 100. What will happen to the confidence interval if the sample size decreases to 80?



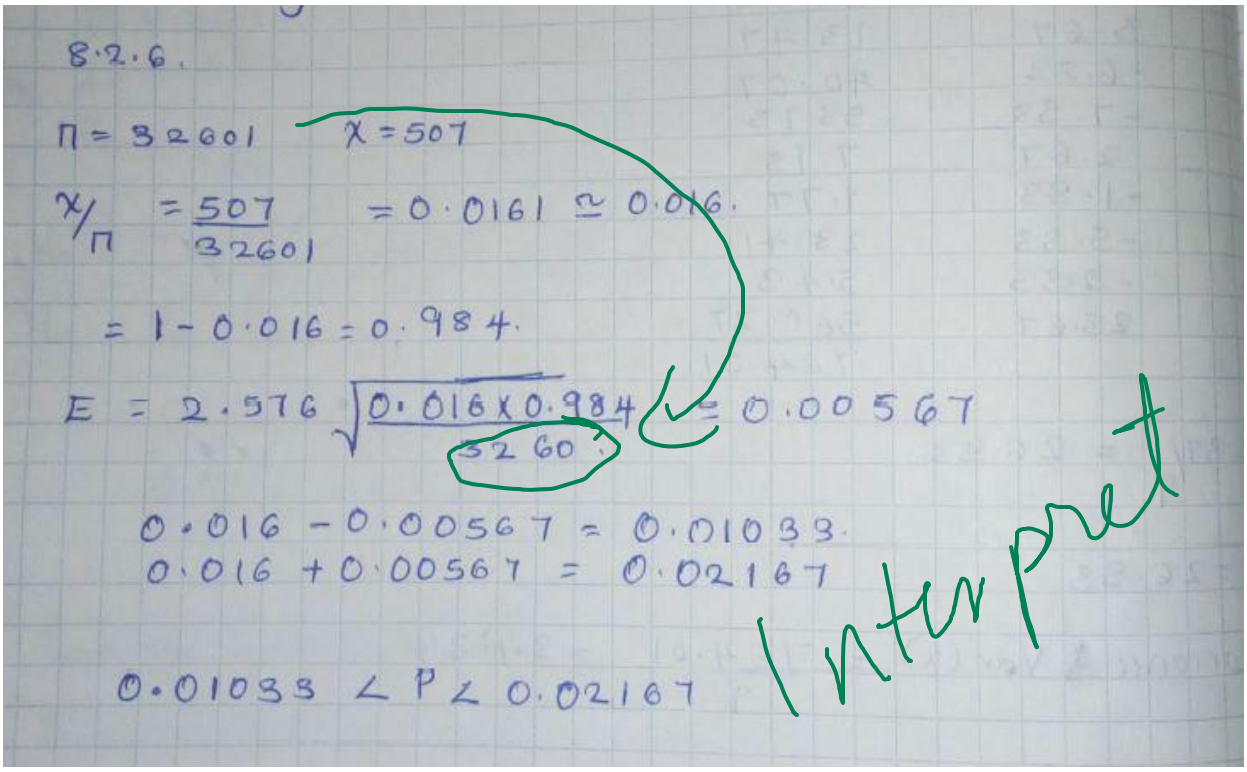
8.1.8

In 2013, Gallup conducted a poll and found a 95% confidence interval of the proportion of Americans who believe it is the government's responsibility for health care. Give the statistical interpretation.



8.2.6

In 2008, there were 507 children in Arizona out of 32,601 who were diagnosed with Autism Spectrum Disorder (ASD) ("Autism and developmental," 2008). Find the proportion of ASD in Arizona with a confidence level of 99%.



8.3.6

The economic dynamism, which is the index of productive growth in dollars for countries that are designated by the World Bank as middle-income are in table #8.3.9 ("SOCR data 2008," 2013). Compute a 95% confidence interval for the mean economic dynamism of middle-income countries.

Table #8.3.9: Economic Dynamism ($) of Middle Income Countries

25.8057	37.4511	51.915	43.6952	47.8506	43.7178	58.0767
41.1648	38.0793	37.7251	39.6553	42.0265	48.6159	43.8555
49.1361	61.9281	41.9543	44.9346	46.0521	48.3652	43.6252
50.9866	59.1724	39.6282	33.6074	21.6643		

8.3.6. μ = 43.873 s = 9.071 n = 26.

$\bar{X} + z \times s/\sqrt{n}$

use t, σ unknown

$43.873 \pm \{1.96 \times 9.071/\sqrt{26}\}$

$43.873 \pm 3.486 = 47.359$

$43.873 - 3.486 = 40.387$

$40.387 < X < 47.359$