6.1 Notes – Confidence Intervals for the Mean   Part 2
(Large Sample)
I.   Estimating Population Parameters

Part A.   A **point estimate** is a _____ for a

_____.

<u>Try It Yourself 1 pg 310</u>
        Market researchers use the number of sentences per advertisement as a
    measure of readability for magazine advertisements. The following represents a
    random sample of the number of sentences found in 30 magazine advertisements.

| 16 | 9 | 14 | 11 | 17 | 12 | 99 | 18 | 13 | 12 | 5 | 9 | 17 | 6 | 11 |
| 17 | 18 | 20 | 6 | 14 | 7 | 11 | 12 | 12 | 5 | 11 | 18 | 6 | 4 | 13 |

    Find a point estimate for the mean sentence length of the population.

Part B. An **interval estimate** is an

_____

_____.

To form an interval estimate, use the _____ as the

_____, then add and subtract a _____.

Before finding an interval estimate, you should first determine

_____ that your interval estimate contains the

_____.

Part C. The **level of confidence** , _____, is the

_____

_____.

The level of confidence, c, is the area under the standard normal curve between the

_____,

For instance, if c = 90%, then how much area lies outside of the confidence interval?
                How much would have to be in each tail?
                What would the critical z-values be?

<u>You try</u>: If c = 96%, what are the critical values?   Sketch and label a picture.

The **margin of error**, _____, is the _____

_____.

When $n \geq 30$, the _____,

_____, can be used in place of σ.

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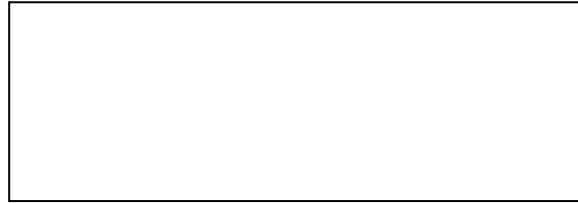### (Large Sample)

<u>Try It Yourself 2</u>

   Use the data given for Try It Yourself 1 and a 95% confidence interval to find the maximum error of estimate for the mean number of sentences in a magazine advertisement.

$n =$ _____ $s =$ _____ (use your calculator to find) $z_c =$ _____

$E =$ _____

II.   Confidence Intervals for the Population Mean

Part A.   A _____ for a population mean μ is

<div style="border:1px solid black; height:180px; width:45%;"></div>

   The probability that the _____ contains μ is _____.

<u>Guidelines</u>:

   Finding a Confidence Interval for a Population Mean ($n \geq 30$ or σ known)

<u>In words</u>	<u>In symbols</u>
1.	
2.	
3.	
4.	
5.	

6. You MUST write your answer in the context of the problem.
   "We are (enter confidence)% confident that the true mean (enter context of problem) is between (enter left endpoint) and (enter right endpoint)."

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<u>Try It Yourself 3</u>
      Construct a 90% confidence interval for the mean number of sentences in a magazine
      advertisement from Try It Yourself 1. Show your work.

Conclusion: We are _____ confident that the true mean _____ is
between _____ and _____.

<u>Try It Yourself 4</u>
      Construct a 99% confidence interval for the mean number of sentences in a
magazine advertisement from Try It Yourself 1. Show your work.

Conclusion:

Analysis: *How do the intervals from Try It Yourself 3 and Try It Yourself 4 compare?*

<u>Try It Yourself 5</u>
A college admissions director wishes to estimate the mean age of all students currently enrolled. In a random sample of 20 students, the mean age is found to be 22.9 years. From past studies, the standard deviation is known to be 1.5 years. Construct a 95% confidence interval of the population mean age?

<u>Sample Size</u>
As the level of confidence _____, the confidence interval _____. As the confidence interval _____, the precision of the estimate _____.
One way to improve the precision of an estimate without decreasing the level of confidence is to
_____.

We can work backwards from the formula for the margin of error (maximum error of estimate) E.

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If σ is _____, you can estimate it _____, provided you have a sample with _____.

<u>Try It Yourself 6</u>
A college admissions director wishes to estimate the mean age of all students currently enrolled. From past studies, the standard deviation is known to be **5.5** years. How many students must be included in the sample if you want to be 95% confident that the sample mean is within two years of the population mean?

<u>Try It Yourself 7</u>
You work for a consumer advocate agency and want to find the mean repair cost of a washing machine. From past studies, the standard deviation is known to be $17.50. How many repairs must be included in the sample if you want to be 99% confident that the sample mean is within **$5.00** of the population mean?