Homework 4

This handout, plus Chapter 9: 17, 18, 21, 23, 24.

Go to `http://noppa5.pc.helsinki.fi/koe/flash/mean/confintn.html`.

This applet takes samples from a standard normal distribution, and then builds a confidence interval for each sample.

Check "Theoretical mean," and click "New Sample."

You can view the sample mean and the values of the confidence interval by clicking on the red arrow, and the blue line representing the interval, respectively.

Record your mean and confidence interval here:

mean:_____ CI:_____

Did your confidence interval cover the true mean? _____

Now click "New Sample" repeatedly until you have 50 samples.

How many didn't include the true mean? _____/50 = _____%

On average, what would you expect this percentage to be?_____%

Try different sample sizes by using the bar on the left.

How does the sample size affect the width of the confidence interval?

Now go to

`http://www.math.csusb.edu/faculty/stanton/m262/confidence_means/confidence_means.html`
(Note the _'s are underscores.) This site is similar, but allows you to change the confidence
level; alpha is one minus the confidence level, so alpha=.05 is 95% confident.

Try different alphas. Which confidence level (90%, 95%, or 99%) has the shortest intervals?

Which confidence level includes the true mean the most often?

Is it possible to decrease the width of the confidence interval without changing the confidence
level? (Think back to the other applet.) How?

So which do you want, a short interval, a high confidence level, or both?

If you picked both, why is having just one insufficient?