Estimation and Confidence Intervals

Point estimate = sample mean = $\bar{x}$ $= 65''$

$63'' < \bar{x} < 67''$

Interval estimate = range of values = $\#<\bar{x}<\#$ or $\bar{x}\pm\#$ $65'' \pm 2''$

Confidence interval = interval obtained from a sample with a specific confidence level.

Confidence interval for a mean (average):

First, decide whether you should use a *t*-interval or a *z*-interval.
If $n<30$ or the standard deviation is unknown, use a *t*-interval.
If $n\geq 30$, use a *z*-interval.

Second, determine the confidence level.
For 90% confidence, use $z = 1.645$
For 95% confidence, use $z = 1.96$
For 99% confidence, use $z = 2.58$

Third, either use a formula or your calculator.
z-interval =

$$\bar{x} \pm 1.96\left(\frac{\sigma}{\sqrt{n}}\right)$$

sample mean; std. dev.; #

t-interval =

On your calculator, press STAT, choose TESTS and choose #7 or #8.

Confidence intervals for a proportion:

First, determine the confidence level. $\hat{p} \pm 1.96\sqrt{\frac{\hat{p}\hat{q}}{n}}$

Second, either use a formula or your calculator.

1-proportion *z*-interval =

where $\hat{p}$ is the sample proportion and $\hat{q}$ is $1 - \hat{p}$

On your calculator, press STAT, choose TESTS and choose option A.

Minimum sample size of an average = $n = \left(\frac{1.96\sigma}{E}\right)^2$

Where E = the maximum potential error.

# of people

std. dev. within

Minimum sample size of a proportion = $n = \hat{p}\hat{q}\left(\frac{1.96}{E}\right)^2$

if you have no data, use $\hat{p} = .5$

Homework
p.151
#1-32
Due Tuesday, April 9