Section 1

A point estimator is a statistic that provides an estimate of a population parameter. The value of that statistic from a sample is called a point estimate. Ideally, a point estimate is our "best guess" at the value of an unknown parameter.

A confidence interval for a parameter has two parts: An interval calculated from the data, which has the form estimate +/- margin of error

The margin of error tells how close the estimate tends to be to the unknown parameter in repeated random sampling.

A confidence level C, which gives the overall success rate of the method for calculating the confidence interval. That is, in C% of all possible samples, the method would yield an interval that captures the true parameter value.

Confidence Level: To say that we are 95% confident is shorthand for "95% of all possible samples of a given size from this population will result in an interval that captures the unknown parameter."

Confidence Interval: To interpret a C% confidence interval for an unknown parameter, say "We are C% confident that the interval from ___ to ___ captures the actual value of the population parameter in context."

The confidence interval for estimating a population parameter has the form statistic +/- (critical value) *(standard deviation of statistic) where the statistic we use is the point estimator for the parameter.

Random: The data come from a well-designed random sample or randomized experiment.

Normal: The sampling distribution of the statistic is approximately Normal.

Independent: Individual observations are independent. When sampling without replacement, the sample size n should be no more that 10% of the population size N (the 10% condition) to use our formula for the standard deviation of the statistic.

Section 1 (cont)

To estimate an unknown population parameter, start with a statistic that provides a reasonable guess. The chosen statistic is a point estimator for the parameter. The specific value of the point estimator that we use gives a point estimate for the parameter.

A confidence interval uses sample data to estimate an unknown population parameter with an indication of hoe precise the estimate is and of how confident we are that the result is correct.

The confidence level C is the success rate of the method that produces the interval. If you use the 95% confidence intervals often, in the long run 95% of your intervals will contain the true parameter value. You don't know whether a 95% confidence interval calculated from a particular set of data actually captures the true parameter value.

Other things being equal, the margin of error of a confidence interval gets smaller as: the confidence level C decreases, and as the sample size n increases.

Section 2

Standard Error	When the standard deviation of a statistic is estimated from data, the result is called the standard error of the statistic.	Notice that we replaced the standard deviation of p^ with the formula for its standard error. The resulting interval is sometimes called a one-sample z interval for a population proportion.

Section 2 (cont)

One-Sample z Interval for a Population Proportion	An appropriate level C confidence interval for p is p +/- z (*p*q/n)^1/2	Use this interval only when the numbers of successes and failures in the sample are both at least 10 and the population is at least 10 times as large as the sample.
Confidence Intervals: A Four Step Process	State: What parameter do you want to estimate, and at what confidence level? Plan: Identify the appropriate inference method. Check conditions. Do: If the conditions are met, perform calculations. Conclude: Interpret your interval in the context of the problem.	The margin of error in a confidence interval includes only sampling variability.
Sample Size for Desired Margin of Error	z* (p$^{q/n)}$1/2 < ME	The margin of error will always be less than or equal to ME if you take p^ to be 0.5