Accel Precalculus   Handout: Confidence Intervals For Means   Name _____
Unit #1: Data Analysis
Lesson #12: Conf Int for Means

EQ:

❖ Terms to Recall:

Measure _____ Statistic _____ Parameter _____
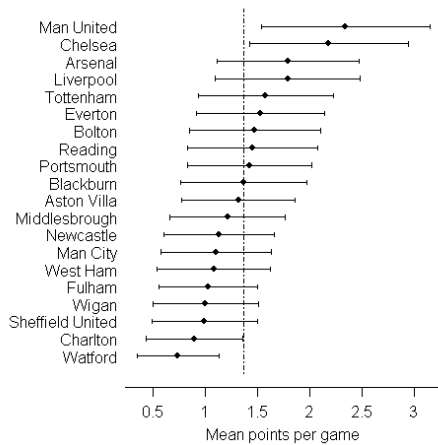
Mean

Standard Deviation

In theory you will never know _____. That is why you use _____ to estimate.
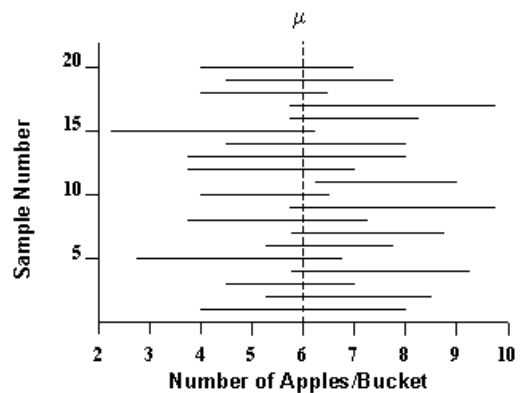
❖ New Terms:

Ex. average age of students might be in interval $17.9 < \mu < 18.7$ or 18.3 ± 0.4 years

                                                      0.4 is called the _____

• Confidence Level --- _____ that the _____ will contain the
   _____.

• Confidence Interval --- specific _____estimate for a _____
   _____ determined by using _____ obtained from a _____.

Mean points per game

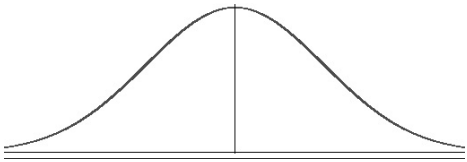**Distribution of Confidence Intervals**

Number of Apples/Bucket

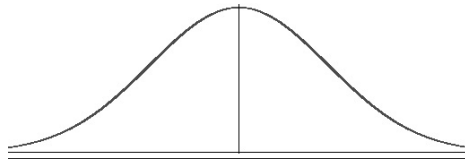➢   See **Table C** for critical values   Common Confidence Intervals: _____

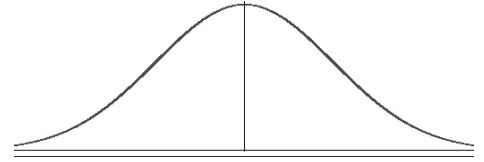Use the Table C to determine the corresponding t* value for each interval when n is very large.

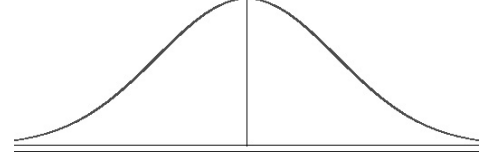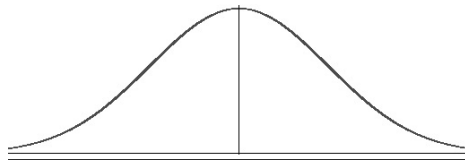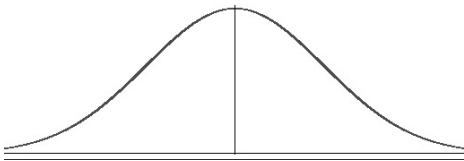| 90%	95%	99%

Verify using Table A of z values

$P(z \leq 1.645) =$ $P(z \leq 1.96) =$ $P(z \leq 2.575) =$

❖ <u>Formula for Confidence Intervals For Means:</u>   _____
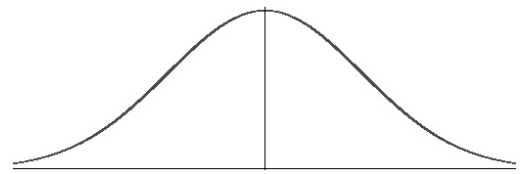
Recall: Standard Error $se =$ _____

Uses a _____-distribution and _____ of _____. df = _____

Recall: Central Limit Theorem
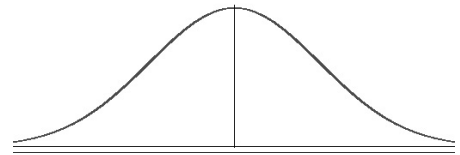When the _____ is _____ enough, $\cong$ 95% of the sample means will fall within 1.96

_____ of the _____.
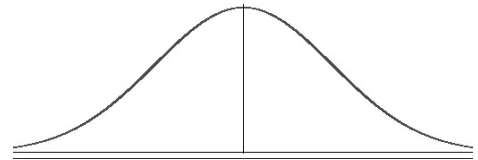
This means for a 95% confidence interval: _____± _____ (_____)

➢ Write the general formula for:

a 90% confidence interval _____

a 99% confidence interval. _____

➢ Ex 1. Find the t^* values for the following then write the general formula for the confidence interval.

a) 90% conf int when sample size is 22
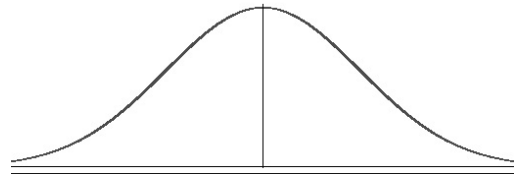
b) 95% conf int when sample size is 15
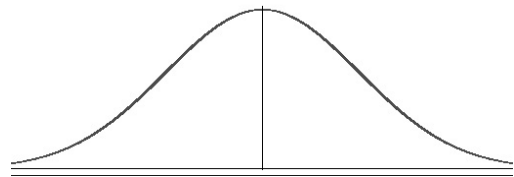
c) 99th percentile when sample size is 30

Confidence Interval Statement: We are _____% confident the **true population mean**

[***write in context of problem***] is between _____ [***write units in context***] and _____[***write units in context***].

➤ In Class Examples. **Place formula and work on your own paper. Make a conclusion statement in context of the problem.**
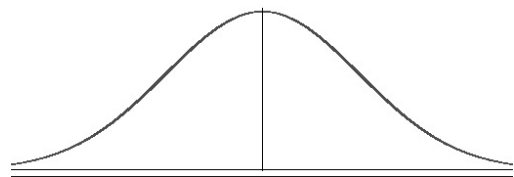
1.   A researcher wishes to estimate the average of money a person spends on lottery tickets each month. A sample of 50 people who play the lottery found the mean to $19 and the standard deviation to be 6.8. Find the best point estimate of the population and the 95% confidence interval of the population mean.

2.   The following data represent a sample of the assets (in millions of dollars) of 30 credit unions in southwestern Pennsylvania. Find the 90% confidence interval of the mean. Use 1-var stat to find needed statistics.

12.23	16.56	4.39	2.89	1.24	2.17	13.19	9.16
1.42	73.25	1.91	14.64	11.59	6.69	1.06	8.74
3.17	18.13	7.92	4.78	16.85	40.22	2.42	21.58
5.01	1.47	12.24	2.27	12.77	2.76		

3.   A study of 30 marathon runners showed that they could run at an average of 7.8 miles per hour. The sample standard deviation is 0.6. Find the point estimate for the mean of all runners. Based on the results, what minimum speed should a runner obtain to qualify in a marathon at a 90% confidence level.

4.   Ten randomly selected automobiles were stopped and the tread depth of the right front tire was measured. The mean was 0.32 in and the standard deviation was 0.08 in. Find the point estimate and the confidence interval of the mean right tire depth for a 95% confidence level. Assume that the variable is approximately normally distributed.

5.   The data below represent a sample of the number of home fires started by candles for the past seven years. Find the point estimate and the confidence interval for the mean number of home fires started by candles each year at a 99% confidence. Assume the variable is normally distributed.

5460	5900	6090	6310	7160	8440	9930

Assignment: Practice Worksheet Confidence Intervals