Today's Agenda:

1. Homework questions?

2. Quick quiz #10 - Using the normal probability tables to calculate relative frequencies.

3. Wrap-up activity for (univariate, or one-variable) statistics.

3) $\bar{x} = 62\% = .62$

$s = 5\% = .05$

$\bar{x} \pm z^*(s)$

$.62 \pm z^*(.05)$

→ $80\% \rightarrow z^* = 1.28$

→ $95\% \rightarrow z^* = 2$

→ $99\% \rightarrow z^* = 2.58$

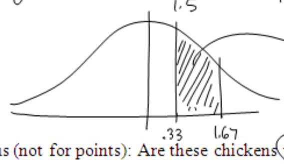
After reviewing the correct solution (below), write your score on the back of your quiz.

0 = no progress at all; just rewrote problem
0.5 = false start, not based on relevant principles
1 = false start, but sustained effort with some relevant principles
1.5 = significant mistake(s), or significant misunderstanding(s)
2 = mistake near the end or could not finish; also excessive reliance on calculator or 'brute force' methods
2.5 = trivial mistake (e.g. arithmetic error), but work is mostly correct
3 = correct answer and work

Some chickens have mean weight of 18.5 kg with a standard deviation of 1.5 kg. The weights are normally distributed. Find the percent of all chickens with weights between 19 kg and 21 kg.

19 Kg: $z = \frac{19-18.5}{1.5} = \frac{1}{3} \approx 0.33 \rightarrow A = .129 = 12.9\%$

21 Kg: $z = \frac{21-18.5}{1.5} = \frac{2.5}{1.5} \approx 1.67. \rightarrow A = .453 = 45.3\%.$



$45.3\% - 12.9\% = 32.4\%$ of chickens are between 19 kg and 21 kg.

Bonus (not for points): Are these chickens unusually large, unusually small, or about the right size?

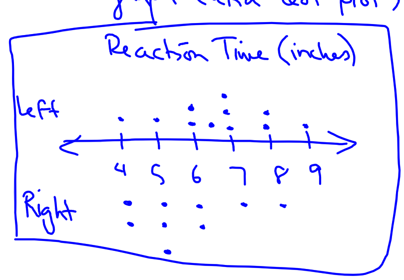
→ 2.2 lbs/kg, so these are 40 lb chickens!!

Objective: Work in groups to create a poster containing the following information related to the ruler drop dataset that you collected at the beginning of our statistics unit. Hang it next to your original display to show your growth in this unit.

For the ruler drop dataset you collected:

1. Use your calculator (or do it by hand) to separately calculate the standard deviations s_L and s_R for your left- and right-hand reaction times. Then use an average (or weighted average if necessary) to find the number s, which will be an estimate for what's called the 'pooled standard deviation' of the *difference* in reaction times.
2. Calculate the difference between the mean reaction times, and calculate a 90% confidence interval for the difference. You will need to use table 10 to find the appropriate z-score.
3. Is zero included in the confidence interval? If not, write a confidence statement about the difference between the reaction times. Otherwise, we say "we have insufficient evidence (at the 90% confidence level) to conclude there is a difference between left- and right-hand reaction times."
4. Produce an appropriate graphical display comparing the reaction time data for the left- and right-hands. See notes below before continuing.
    a. A scatterplot (or related chart) is not appropriate because the order of the data points is not meaningful.
    b. A histogram or frequency polygon is not appropriate because the dataset is so small. They are also not very useful for comparing two samples.
    c. Side-by-side box plots are great for comparing two samples in a situation like ours. Unfortunately, unless you have more than about a dozen datapoints, the "five-number summary" can be somewhat misleading.
    d. A dot plot (a.k.a. number line plot) is a nice alternative to a side-by-side box plot when you have relatively small datasets. I suggest you create one of those as a graphical representation of your two samples.

Line graph (aka dot plot):



pooled st. dev for the mean difference:

$$S = \frac{\left(\frac{S_L + S_R}{2}\right)}{\sqrt{n}}$$

where n is the number of "drops" conducted per hand.

Confidence interval: $\bar{x} \pm z^*(S)$