(3) $n = 50$ $X \sim$ alcohol content in a bottle of cough syrup

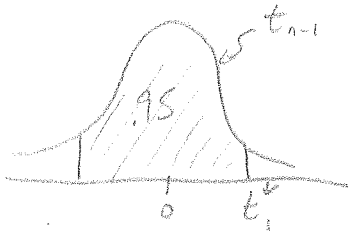
95% CI for $\mu_x \Rightarrow [7.8, 9.4]$

a. A 90% CI would be narrower.

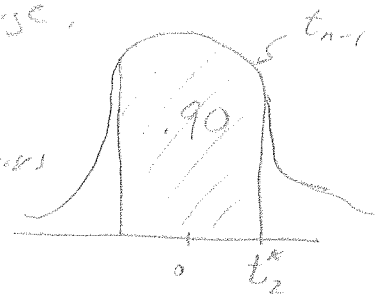
Look @ the bounds:

lower bound	upper bound
$\bar{x} - t^* \frac{s}{\sqrt{n}}$	$\bar{x} + t^* \frac{s}{\sqrt{n}}$

If we are using the same sample, $\bar{x}$, s, n do not change. The critical value t^* will change.



The critical value t^* will decrease as the level of confidence decreases



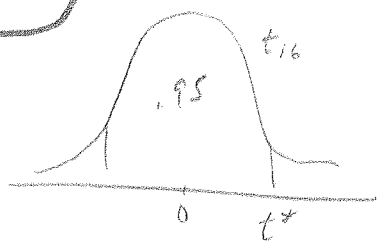
$t_1^* > t_2^*$

b. This statement is incorrect! The probability lies only in the random sample itself. The value, μ_x, will not change (or be random) therefore there is no probability associated with it.

c. Incorrect! The 95% interval is an estimate for μ. It should not be seen as a probability boundary for individual outcomes X_i.

d. This is almost a correct statement. Remember that the sample is random and therefore, the interval itself is random. If the process was repeated an infinite # of times, the statement would be valid

(33c) $\bar{x} = 438.254$ $s = 15.1446$



$t^* = 2.119905$

95% CI for $\mu_x \Rightarrow \bar{x} \pm t^* \frac{s}{\sqrt{n}} = [430.5077, 446.0805]$

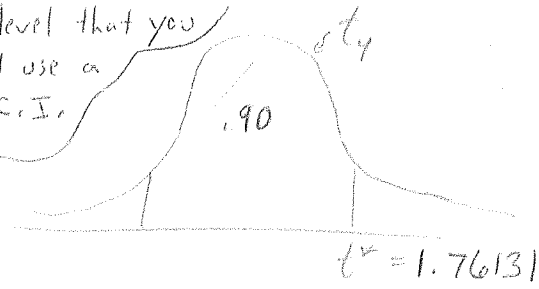
c. Yes, 440 is a plausible value for μ_x

450 is not plausible

35a

a. Pick a confidence level that you want to use. I'll use a 90% C.I.

$\bar{x} = 25.0$
$s = 3.5$
$n = 15$



$\bar{x} +/- t^*\left(\frac{s}{\sqrt{n}}\right)$

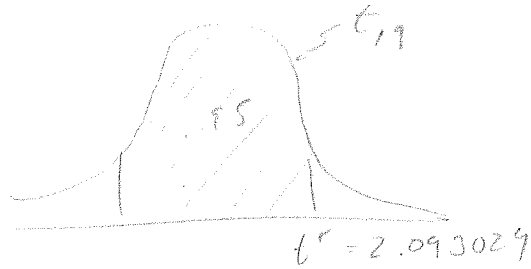
90% C.I. $\mu_x = [23.4083, 26.5917]$

I am 90% confident that the true value of the population mean for mean failure strain is between 23.41% and 26.59%.

37a

a. 95% CI for μ_x

$\bar{x} = 0.9255$
$s = 0.080942$
$n = 20$



95% CI $\rightarrow \mu_x = [.887616, .963384]$

I am 95% confident that the interval [.887616, .963384] covers the true mean cadence.