- 3.62
 - cr. The purnetur of interest in the case is the tre mean chrometic curtures of cub spielers an drivers, denoted by p. The is the average lead of chrometic curtures between the cub spieles and the abilities they are sitting an. The researches are interested in whether this mean curtures is less than Tv. as a curture of To ar questa allows bulk to see the spieles.
 - Ь. Ho: µ≥70 Ha: µ<70
 - C. $\bar{\chi} = \sqrt{57} + 75 + 1.6 + 37 + 96 + 61 + 56 + 2 + 43 + 52) = 10 = \frac{1.5}{2}$ $S^2 = \frac{1}{10} \left[\sqrt{57} - 57.53^2 + \sqrt{75-57}.53^2 + ... + \sqrt{45} - 57.53^2 + \sqrt{32-57}.53^2 + \frac{1}{10} - 1.066.845$ $S^2 = \sqrt{1066.845} = 32.64$

n =10

- cl. et = 10 1 = 9 cml a = 0.10 Using a t-table. we can find that the catcal value is approximately - 1.38. rejection regim = t 2 - 1.38
- e. Je tost statutic ne culubral . 1.21, is not less then the custocal value of -1.38 Thurfue ne als not reject the will hypothesis.

In the curtaint of the problem, this interns that we also unt have sufficient existence to curchile that the time men character currante of cub spicles on claising is less then 70. This supports that, on currange, the currant may be high enough for book to see the spicles.

r

 $(104.25-62.24) \pm 2.576 \times \sqrt{\frac{(45.45)^{2}}{41}} \frac{116.491^{2}}{49}$ (22.74.61.24)

This mans that we are 99% confident that the two difference in mean time between schoophyrenics and normal individuals lies within this interval.

Sie this internel is entrely graden the U. it supports the carchien from put C that the the the one the TheT for schippheness is significantly graden the over the for mound individuals.

9.17 a. 1/0: p. - p. 200 Ha ' p. - prz = v b. Two - supple t-tot (cosserving equal variance) $t = \frac{(\overline{x_1} - \overline{x_2}) - (\mu_1 - \mu_2)}{Sp} \cdot \sqrt{\frac{1}{\mu_1} + \frac{1}{\mu_2}}$ Sp = J (20-1) (1,98)² 20+20-2 ∑ J4, WEE6

 $SP = \sqrt{\frac{(m-1) \cdot S^{2} + (m+1) \cdot S^{2}}{m + m - 2}}$ $t = \frac{3 \cdot 3 v \cdot 2 \cdot 7 v - v}{\sqrt{\frac{1}{2v} + \frac{1}{2v}}}$

Given x1 = 3.30 . x2 = 3.70. 51-2.3. 52-1.98 N: 11: 20

The court values of a we expressionally - 1. bob and 1. bob. Judge. He rejeases region for this test is C. df = n. + n2 - 2 - 20+20-2 tx-1.686 cuel t > 1.686. = 38 The news that it is that statute is less then or grande them 1.686. we muld reject the well hyperthesis. a = v.10

= -0.615

ch. The tot storts the versentures there and seen .

e. The pruhe of 0.62 is gurter them the signifunce land of 0.10. This many that if the add hypothess use the there is bay. chure that we made absent a tost students as externe as -0.65 or more so. This high provide suggest the absent additione in memory culd very nell be able to variant chance, and it provides futher support for not vejerting the add hypothess.

J. 1. Independence: The two grups of cholum must be independent of each other.

2. Nhundsty: The distibution of reall serves in each graps shall be experiencedly neural. . Com be relaxed if 1 > 30.

3. Equil variances: The variants of the reall screes in the two graps shall be approximately equil. This is the assumption of humasacolasticity.

If the culture is not meet, a different verson of the t-tool that close not assume equal various can be used.

9.24 $\alpha. \quad \bar{x}_1 = (31 + 74 + 129 + 96 + 92) \div 5 = 104.4$ $S_{1} = \sqrt{(151 - 104, 4)^{2} + \sqrt{4} - (14, 4)^{2} + ... + (y_{2} - 104, 4)^{2}} = 24.895$ $\overline{x_{2}} = 55.8$ x-: 55.8 52: 13. 103 Sp = 19.84 (104.4-55.8) ± 1.96 × 19.84 × 15.5 43.6 ± 1.96 × 19.84× ~~+ This intend is settly gunter there is with mens that we are gst. cufillent that the the cliffence in mean buttin thisfer between a hidehibe and a high fire les within this internal. Since the internal aloses not inchable U. it provides stury evidence that mare buter are sugared ching a haddhake compared with a ligh fire. supporting the researchen's statement. x1: 55.8 <u>b</u>. X3 = 115 + 14 + 21 + 24 + 21) - 20 ss = 6 Sp = 11. 25 (55.8-20) ± 1.96. 11.85. 1++++ 1.50.71

The intend is externel gunter than a note means that we are got cufillent that the the are difference in mean butter trasfer between a hadehabe and a high fire bies within this intend. Since the intend alors not include a, it grows stury evidence that more buttern are turginal ching a huddhabe compared with a high fire. supporting the researcher's statement.

C. Bund un the results from part a and b. the first browned express to truster the hart among of buteria, making it the most hygiena grading method among the three total. The haddhake trustices the most buteria, while the high fire is intermediate. Tenfre, if hygiene is the privary concern, the first browne until be the recommulal grading model.

9.112 C. When comparing meni from multiple graps using techiques like ANDUAL, one key assumption is the assumption of homogeneity of variances. The means that the matching causes the different graphs is assumed to be mighty equal.

- b. We can use levere's test or Bartlett's test, which both lasts have the will hypothesis that the variances are equal.
- Given that we have small surple sizes. Levere's toot is generally considered use report.
- Verince for se hooldande is group = 65.3 Verine for se fist boop group = 36
- Using Withme Lugarge. He prote from Leven's tot is approximatly o wof25.
- Given the this prode is bes then the significance level of 0.05. We reject the will hypothes that the revenue of the two gamps are equal. This suggests that the assumptions of equal reviewes may use be resembly satisfied when company the healthke to the fit broup.
- C. If the assumption of equal variances is violated, as suggested by the result of Leven's test in put b. it ended affect the velocity of the informs made.
- When comparing means. the assumption of equal variances is important because tools like ANUAA and t-toot assume that the variances of the graps being compared are equal. If the assumption is violated, these tools can provide mislenbrag ventors, portactively leading to incorrect conclusions.
- In portaler, if the values are not equil. the test may be a higher or lover actual significance land than the position significance level. This means that we might reject will hyporthesis more a loss often than we intend to.
- We can also use Welch's to but and ANOWH that als at assume equil variances.