

(POINTS) SHOW YOUR WORK/STEPS! JUSTIFY YOUR ANSWERS!
 SUBJECT TO CLASS REMARKS ON USE OF CALCULATORS.

(80) 1. One of our analysis of variance homework problems had data

	Sample 1	Sample 2	Sample 3	Sample 4
	86	90	87	94
	82	85	93	99
	76	86	89	97
	91			
sum:	244	261	269	381

(a) (b) (c) & (d) Given $\sum x^2 = 103083$, $\sum x = 1155$, and the total sum of squares SST is 405.6922, make an ANOVA table, write the standard test of hypothesis for equal means, conduct the test, and state the proper conclusion.

$$SST = \frac{244^2}{4} + \frac{261^2}{4} + \frac{269^2}{4} + \frac{381^2}{4} - \frac{1155^2}{16} = 349.609 \quad SSB = 465.692 - 349.609 = 120.083$$

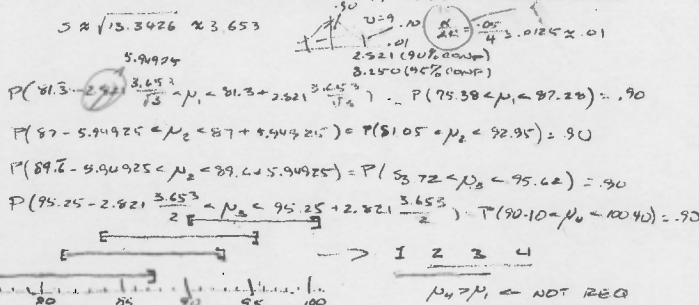
(c)

	SS	DF	MS	F
SAMPLES	345.609	3	115.203	3.634
W/BETWOR	120.083	9	13.3426	
TOTAL	465.692	12		

(d) $H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$
 $H_a: \text{THIS NOT TRUE}$

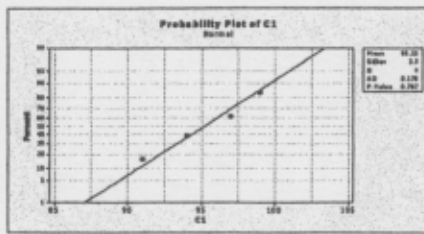
Decision Rule: $F > 3.86$
 $3.634 < 3.86$
 CONCL: REJ H_0

(e) Make one of those sketches of the interval estimates of μ_i , $i=1,2,3,4$ and underline the like sets.



(f) To justify the above computations we should know that the populations are normal and the variances are alike.

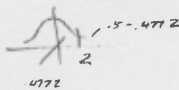
- 2.5 (i) What test for homogeneity of variances did we study? **BARTLETT'S**
- 2.5 (ii) A Minitab normal test for the data of sample 4 is shown. What number!!!! here best!!!! says whether or not that data appear normal? **P-VALUE**
- 2.5 Does it say this data does or does not appear normal? **DOES APPEAR NORMAL**
- 2.5 How does it say that? **P-VALUE of α**



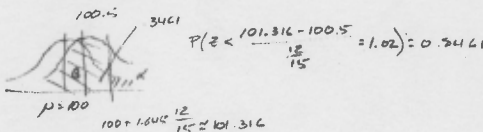
$H_0: \mu = 100$ $n = 225$

- (30) 2. (a) Run the test $H_a: \mu > 100$ if your sample is $\bar{x} = 101.6$. (n is large - use the p-value; also state your conclusion)

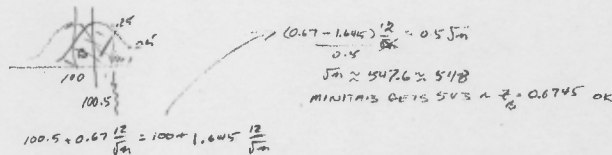
$$P\text{-VALUE} = P(Z > \frac{101.6 - 100}{\frac{1.4}{\sqrt{225}}} = 2) = 0.0228 < \alpha = 0.05$$



(b) Suppose $\mu = 100.5$, what is β ?



(c) What sample size would be required to make $\beta = 75\%$?



(15) 3. Given

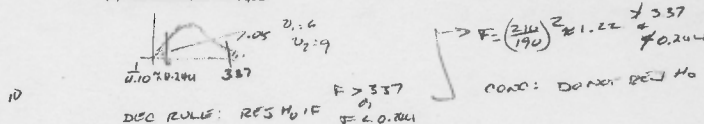
	1	2	3
Number Defective	8 (6.7)	5 (6.7)	9 (6.7)
Sample Size	30	30	30

write and conduct a formal test whether the proportion is the same in all lines with 5% significance.

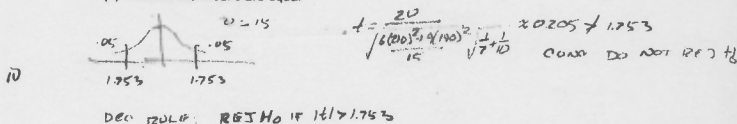
2.5 $p = \frac{20}{90} \approx 0.22$ $H_0: \text{PROP IS COMMON}$
 $H_a: \text{PROP IS NOT}$
 $\alpha = 0.05$

- (20) 4. Given $\bar{x}_1 = 3260$ and $\bar{x}_2 = 3240$, test whether $s_1 = 210$ $s_2 = 190$

(a) the variances are equal



(b) whether the means are equal



with 10% significance.