STATS 200 EXAM 2 Nov. 13, 2019

PRINT Name ______________________ ____________________
Last (family) name First name

Circle Section:
L1 ONL S1 S2 S3 S4

Net ID ____________________ Signature ________________________

Instructions- This is a closed book, closed notes exam. You have 1.5 hours to complete it.

- **At the end of this exam, you must return this exam with all pages, and you must return your scantron sheet. Please circle all of your answers on this exam and fill in all of your answers on the scantron.**
- **If you do not turn in a complete exam and scantron form, you will receive the grade AB (Absent) for this exam.**
- Use a **#2 pencil**. **Each question has only *one* answer**. If you bubble in more than one answer it will automatically be marked wrong. Erase mistakes completely.
- This exam is **either Form A, or B.** You don't know which test form you have so you MUST turn in your scantron with the exam so the TAs can correctly mark the test form box on your scantron sheet after the exam.

READ → How to fill out the Scantron form

- Print and bubble in your **LAST NAME with NO SPACES or DASHES** starting in the left most column. Print your **FIRST INITIAL** in the right-most column.
- Print and bubble in your Student ID number (UIN) **NO SPACES or DASHES** in the Student Number box.
- Print and bubble in the date in the Date box.
- **Print and bubble in your NET ID with NO SPACES or DASHES in the NETWORK ID box.**
- **Print and bubble in the Section Box. See section codes.** →
- *Write Stat 200* on the COURSE line.
- *Write your instructor's name* on the INSTRUCTOR line.
- *Write your section on the SECTION line.*
- Sign your name, and right underneath the student signature line PRINT your name

Section Codes:

ONL (Fireman) = 00001
L1 (Fireman TR 9:30am) = 00002
S1 (Yu MWF 10am) = 00003
S2 (Chakrabarty MWF 1pm)= 00004
S3 (Liu MWF 9am)= 00005
S4 (Zhou TR 2pm) = 00006

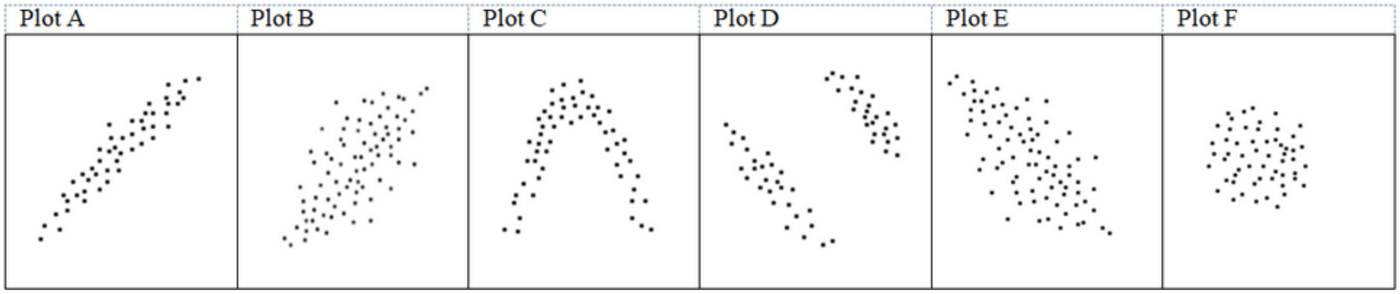
Warning -All Cheating including being caught with a non-permissible calculator or formula sheet will result in a 0 and an academic integrity violation on your University record.

CHECK NOW THAT YOU HAVE COMPLETED ALL OF THE STEPS. Before starting the exam, check to make sure that your test booklet is complete. You should have **9 pages (63 problems)**, including **3 tables**: the normal table, the chi-square table, and F, but you may not need them all.

Formulas: $SD_{errors} = \sqrt{1-r^2} * SD_y$ $\quad SE_{slope} = \dfrac{SD_{errors}}{\sqrt{n} * SD_x} = \dfrac{\sqrt{1-r^2}}{\sqrt{n}} * \dfrac{SD_y}{SD_x}$

There is class tomorrow!

Questions 1-6



For each plot listed below, determine whether r is appropriate to use. If so, choose the r which best represents the plot.

(Choose a, b, c, d, e or for each plot. One of the 5 choices will be used twice and the others will each be used once.)

1)	Plot A	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5
2)	Plot B	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5
3)	Plot C	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5
4)	Plot D	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5
5)	Plot E	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5
6)	Plot F	a) Not appropriate to use r	b) r = 0.9	c) r = 0	d) r =0.5	e) r = -0.5

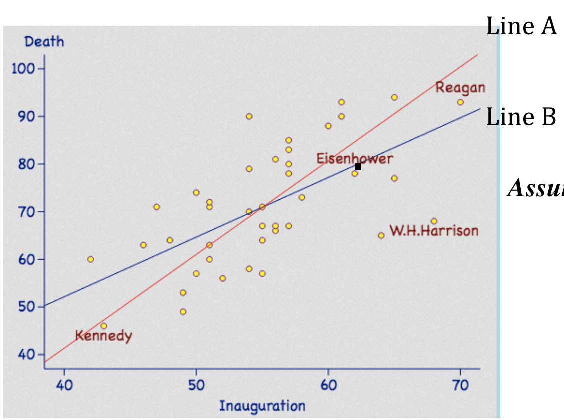
Questions 7-9 pertain to X and Y are 2 sets of numbers with a correlation coefficient of **r = - 0.4.**

7) If all the X values are multiplied by negative 2, the new correlation coefficient would be
a) 0.4 b) -0.4 c) 0.8 d) -0.8 e) Not enough information given

8) If the original X and Y values are all multiplied by negative 2, the new correlation coefficient would be
a) 0.4 b) -0.4 c) 0.8 d) -0.8 e) Not enough information given

9) If the original X and Y values were converted to Z scores the new correlation coefficient would be
a) 0 b) 1 c) 0.5 d) -0.4 e) Not enough information given

Questions 10-15 pertain to the scatter plot below depicting the ages at Inauguration and death of US Presidents.



Assume Kennedy falls exactly on Line A and Eishenhower falls exactly on B.

10) Two lines are shown. One is the regression line and one is the SD line. Which is the ***regression*** line? **a)** Line A **b)** Line B

11) The correlation coefficient is closest to… **a)** 0 **b)** 0.3 **c)** 0.6 **d)** 0. 9 **e)** 1

12) About what is the average age at Inauguration? **a)** 50 **b)** 55 **c)** 60 **d)** 65 **e)** 70

13) Which President has a positive residual? **a)** Kennedy **b)** Eisenhower **c)** Reagan **d)** All **e)** None

14) Which President has the same Z scores for Inauguration and death? **a)** Kennedy **b)** Eisenhower **c)** Reagan **d)** All **e)** None

15) What happens to r if we remove W.H. Harrison? **a)** r increases **b)** r decreases **c)** r stays the same

Questions 16-29 Below are the 5 summary statistics for the ACT(verbal) and Final Exam scores of 81 students in Stat 100. (Assume the scatter plot is roughly football shaped.)

	Avg	***SD***
ACT (verbal)	26	4
Final Exam	75	10

r = 0. 2

16) One student has a Z = -2 on the Verbal ACT, what's the regression estimate for his Z score on the Final Exam?
a) -2 b) -1.2 c) -0.4 d) – 0.2 e) 0.2

17) Another student has a Verbal ACT of 32, what's the regression estimate for her Final Exam score?
a) 90 b) 87 c) 78 d) 77 e) 75

18) What is the slope of the regression line for predicting Final scores from ACT scores?
a) 0.25 **b)** 2.5 **c)** 0.08 **d)** 0.2 **e)** 0.5

Now suppose the 81 students were randomly drawn from the entire population of 2000 students enrolled in Stat 100

19) This corresponds to drawing 81 points at random without replacement from a scatter plot depicting the
a) Final and ACT scores of the 100 randomly drawn students
b) Final and ACT scores of all students in the University
c) Final and ACT scores of all 2000 students in the larger class.

20) The SE_{slope} = 0.27 , a 95% Confidence Interval for the population slope (β_1) using the normal curve is closest to

a) (0.23, 0.77) **b)** (-0.54, 54) **c)** (-0.04, 1.04) **d)** (-4.5, 1.45) **e)** not enough info

21) To change the SE_{slope} above to the SE^{+}_{slope} you would multiple by
a) $\sqrt{\frac{79}{81}}$ b) $\sqrt{\frac{81}{79}}$ c) $\sqrt{\frac{81}{80}}$ d) $\sqrt{\frac{80}{79}}$

22) A 95% Confidence Interval for β_1 using the t curve would be _______ than the one above using the normal curve.
a) wider than **b)** narrower than **c)** exactly the same as

23) To test **H_0: β_1=0 against H_A: $\beta_1 \neq 0$** in the model $\widehat{\text{Final}} = \beta_0 + \beta_1(\text{ACT})$ which of the following significance tests would ***not*** be appropriate? **a)** Z **b)** t **c)** χ^2 **d)** F **e)** They'd all be appropriate

24) Z = **a)** 1.85 **b)** 0.5 **c)** 3.43 **d)** 2 **e)** not enough info (Assume Z test is appropriate)

Questions 25-29 Assume the Z-test yielded a p-value = 6.43%.

25) Would we Reject H_o at 5% significance level? a) Yes b) No

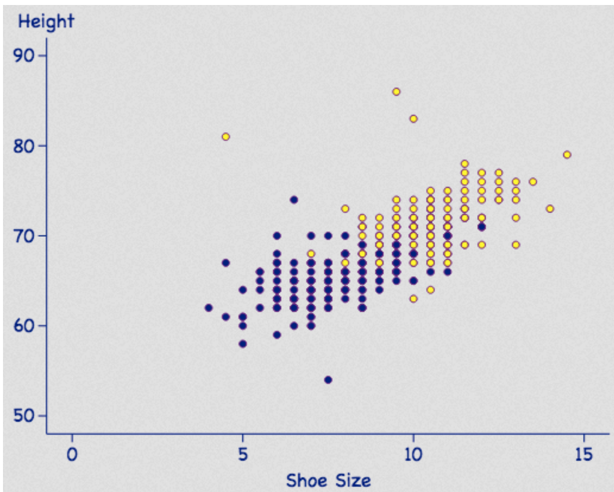
26) Would our 95% CI for β_1 include 0? a) Yes b) No

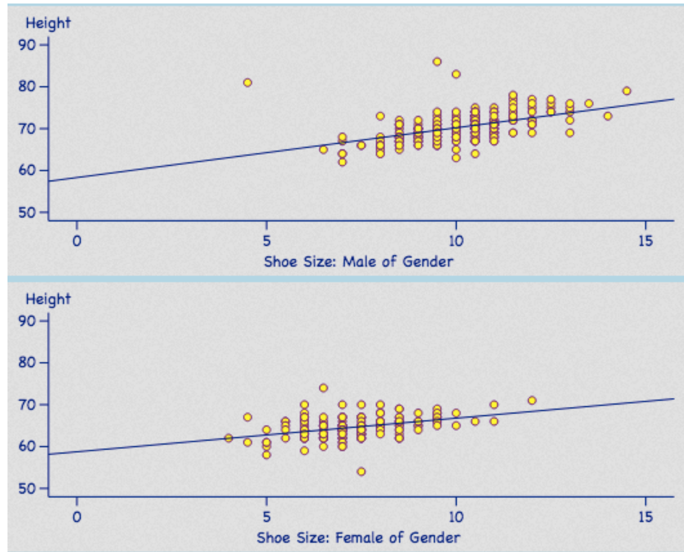
27) The t-test would yield a p-value _____**6.43%** a) > b) < c) = d) not enough info

28) The χ^2 test would yield a p-value _____**6.43%** a) > b) < c) = d) not enough info

29) If we changed to a **1-sided H_A**: $\beta_1 > 0$, the **Z stat** would give a p-value =
a) 6.43% b) 3.215% c) 12. 86%

Question 30-32 pertain to the scatter plots below show the results on the **398** students who reported their shoe size and height (in inches) on Survey 1. The plot on the left shows all 398 students. The males are shown as light colored points and females as dark colored points. The 2 scatter plots on the right split the data into separate plots for males and females.





Height = 54.11 + 1.548 × Shoe Size	r = 0.7249

Male	Height = 58.31 + 1.189 × Shoe Size	r = 0.4976
Female	Height = 58.75 + 0.8027 × Shoe Size	r = 0.4073

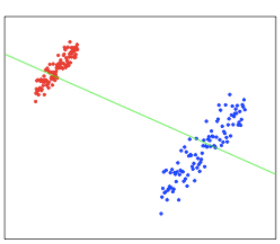
30) Why is r lower in the separate male and female plots on the right compared to the combined plot on the left?
a) r is lower in the separate plots because n is lower (The separate plots have 236 males and 162 females, instead of 398 for the combined plot)
b) r is higher in the combined plot because males have higher values for both shoe size and height which increases r.
c) The absolute value of r is always lower when you stratify data.

31) Translate the male and female regression equations above into an equivalent multiple regression.
Code Males=0 and Females=1 for the Gender variable.
a) Height = 54.11 + 1.548 (Shoe Size) + 4.2 (Gender) - 0.359 (Shoe Size*Gender)
b) Height = 58.75 + 0.807 (Shoe Size) - 0.44 (Gender) + 0.3863(Shoe Size *Gender)
c) Height = 58.31 + 1.189 (Shoe Size) + 0.44 (Gender) - 0.3863(Shoe Size*Gender)
d) Height = 58.31 + 1.189 (Shoe Size) - 0.3863 (Gender) + 0.44 (Shoe Size*Gender)

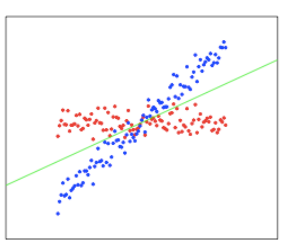
32) If you switched the code to Females=0 and Males=1, which one of the following would change?
a) Scatter Plots pictured above **b)** Multiple Regression Equation **c)** Simple Regression Equations

Questions 33-34 refer to the 4 plots below, each displaying 2 separate groups. Let's say we're trying to figure out if X causes Y and the data consists of 2 prior groups, A and B. Which of the plots display confounding and which display interactions.

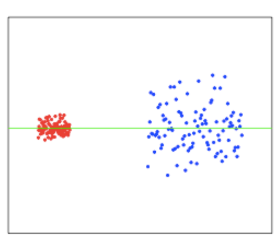
Plot 1



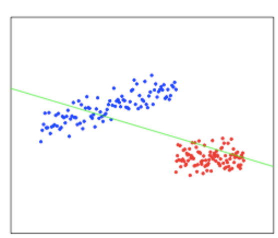
Plot 2



Plot 3



Plot 4



33) Plot 1 has **a)** Only Confounding **b)** Only Interaction **c)** Both **d)** Neither
34) Plot 4 has **a)** Only Confounding **b)** Only Interaction **c)** Both **d)** Neither

35) The numbers in the table show the average hourly wages classified by Gender and Job Category for a group of workers. Fill in the blank in the equation to make the equation match the table :

	Male (Gender=0)	Female (Gender=1)
Service (Job=0)	$15	$10
White Collar (Job=1)	$25	$17

Hourly Wage = 15 + -5 G + 10 J + ___ JG

a) 6 **b)** -8 **c)** 17 **d)** -3 **e)** 3

Questions 36-48 On our first Survey **398** Stat 200 students reported their height, gender and weight. Here is the multiple regression equation predicting weight (in lbs.), from gender (Males=0, Females=1) and height(in inches).

$\widehat{\text{Weight}} = \mathbf{-57} - \mathbf{17}(\text{Gender}) + \mathbf{3}(\text{Height})$ (Numbers were rounded to whole numbers.)

36) The above equation describes the best fitting ____________ **a)** line **b)** plane **c)** ellipsoid

37) through all the points so as to minimize the sum of squared errors in _______ **a)** Weight **b)** Gender c) Height

38) Two males differ by 2 inches in height. The regression equation predicts that the taller man will weigh ____lbs more.
a) 3 b) 6 c) 20 d) 23 e) 57

39) A male is 2 inches taller than a female. The regression equation predicts that the male will weigh ____lbs more.
a) 3 b) 6 c) 20 d) 23 e) 57

40) The multiple correlation coefficient is **R= 0.62 (rounded)** How was that calculated?
a) R is the correlation between the 3 variables once each variable has been controlled for the other two.
b) R is the correlation between the students' predicted weights and their actual weights.
c) R is correlation of the 3 variables once converted to Z scores.

Imagine that the 398 students were chosen from a much larger population of all Stat 200 students.
Compute χ^2 and F stats to test. **H_0: All slope β's= 0 against H_A: At least one slope β≠ 0 for the model** $Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2$

41) χ^2 test statistic = **a)** 248.53 **b)** 15.76 **c)** 123.33 **d)** 11.11

42) F test statistic = **a)** 248.53 **b)** 15.76 **c)** 123.33 **d)** 11.11

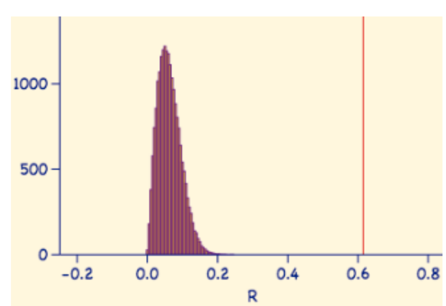
43) When the null is true the mean of the χ^2 distribution = ______ and the mean of the F distribution = _______.
a) 2, 1 **b)** 3, 1 **c)** 0, 0 **d)** 1, 1 **e)** 398, 395

44) Comparing our χ^2 and F stats to those means (and looking at the tables), we know that the p-values for both tests are very close to _____. a) 0% b) 1% c) 2.5% d) 5% e) 10%

45) Conclusion: a) Reject the null and conclude at least one of the slopes is significant.
b) Reject the null and conclude both slopes must be significant.
c) Cannot reject the null.

46) To test the individual slopes to see which one was significant, the computer did a t-test. How many degrees of freedom for the t-tests a) 2 b) c c) 395 d) 396 e) 397

47) Another way to compute the p-value for the overall regression model is by the re-randomization test. The histogram on the right shows the randomization test results of 100,000 randomizations showing the distribution of R's. What does the vertical line mark?
a) R= 0.62, our sample R
b) 0.62% significance level
c) The significance level corresponding to 100,000 randomizations.



48) The p-value given by the randomization is closest to
a) 0% b)0.1% c) 0.6%

Questions 49-56

The table displays the survey responses of **317** Stat 200 students to the question: **"On a scale of 0-10, how do feel about the amount of "political correctness" there is on this Campus today?"** *0 is not nearly enough and 10 is way too much.* The students also identified their ethnicity. Imagine the **317** students were randomly sampled from a much larger population of all Stat 200 students.

	Ethnicity	Average	SD	n
PC rating	White	6.167	2.072	78
PC rating	East Asian	5.307	2.200	153
PC rating	South Asian	5.635	1.871	52
PC rating	Other	5.294	2.573	34

Questions **49-51** ask you to fill in 3 of the missing cells in the ANOVA table is below.

49) How many degrees of freedom for the Model ? **a)** 2 **b)** 3 **c)** 4 **d)** 312 **e)** 313

50) The F-stat for testing the null hypothesis that all group means are the same in the population is:
a) 0.345 **b)** 0.28 **c)** 1 **d)** 2.895 **e)** Not enough info

51) R^2 is closest to **a)** 0.027 **b)** 0. 164 **c)** 0.34 **d)** 1.2 **e)** Not enough info

Source	SS (Sum of Squares)	df	Mean Square	F Statistic	P-value
Model	SSB= 41.14	df=_____	MSB= 13.71	F=________	< 0.005%
Error	SSW=_________	df=_____	MSW= 4.736	SD^+_{errors} = __________	
Total	SST=1523.65	df= 316		R^2 = _______	

52) What do you conclude?

a) That all the group averages are significantly different from each other.
b) That at least one of the group averages is significantly different than the others.
c) That none of the group averages are significantly different from each other.

Compute the t-statistic to test whether the difference between White and Other is significant.

53) What is the $SE^+_{difference}$? Use SD^+_{errors} = 2.176 .

a) $2.176\sqrt{\frac{1}{78}+\frac{1}{34}}$ **b)** $2.176\sqrt{\frac{1}{2.072}+\frac{1}{2.573}}$ **c)** $\sqrt{2.176}\sqrt{\frac{1}{78}+\frac{1}{153}}$

54) What is the t-statistic? a) $\frac{0.498}{SE^+_{difference}}$ b) $\frac{0.873}{SE^+_{difference}}*\sqrt{313}$ c) $\frac{0.873}{SE^+_{difference}}*313$ d) $\frac{0.873}{SE^+_{difference}}$

55) How many degrees of freedom? a) 33 b) 77 c) 313 d) 316

56) The p-value is 5.2%. The Bonferroni correction would __________ the p-value by ____
a) multiply, 2 b) multiply, 3 c) multiply, 6 d) divide, 2 e) divide, 3

57) The difference between Whites and East Asians is smaller than between Whites and Other but it's more significant (p=0.417% compared to p=5.2%). Why?

a) n is larger for East Asians (153 vs. 34) which lowers the $SE^+_{difference}$ making a smaller difference more significant.

b) The Bonferroni correction adjusts for such contradictions making the larger differences the more significant .

Questions 58-59 pertain to this situation: 40 numbers are divided into 4 groups of 10 numbers each. The 4 group means are: 1, 4 and -2, and -3. The overall mean of the 40 numbers is 0.

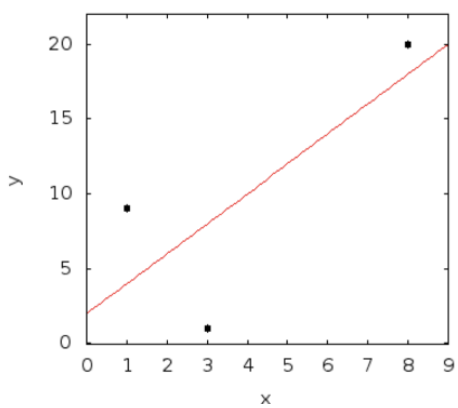
58) Calculate the SSB **a)** 300 **b)** 30 **c)** 90 **d)** 100 **e)** Not enough info to calculate

59) Do you have enough information to calculate the SSW and the SST?
a) Yes, both **b)** No, only the SST **c)** No, only the SSW **d)** No, neither.

60) In an ANOVA analysis comparing group means, if SSB = 0, then what ***must*** be true:
- **a)** All group means = 0
- **b)** The overall mean = 0
- **c)** All group means are the same.
- **d)** All of the above
- **e)** None of the above

61) In an ANOVA analysis comparing group means, if SSW= 0, then what ***must*** be true:
- **a)** The numbers within each group must sum to 0.
- **b)** The numbers within each group are the same.
- **c)** All group means = 0
- **d)** All of the above
- **e)** None of the above

Questions 62-63
Suppose a random sample yields these 3 points: (1,9), (3,1), (8,20).
The sample regression equation is $\hat{y} = 2 + 2x$ The 3 points and the regression line are shown below.

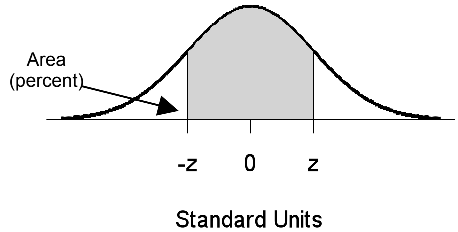


62) SST = a) 182 b) 200 c) 96 d) 104 c) 78

63) SSM= a) 182 b) 200 c) 96 d) 104 c) 78

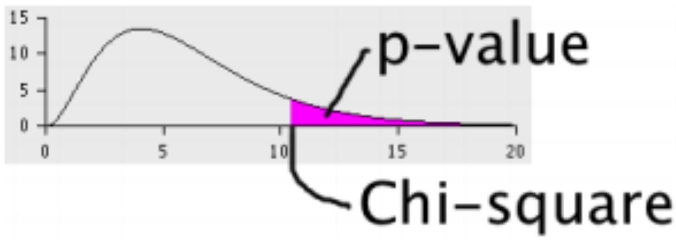
You are now finished with this exam. Go back and checked that you answered all the questions and filled in your Scantron correctly.

STANDARD NORMAL TABLE



z	Area		z	Area		z	Area
0.00	0.00		1.50	86.64		3.00	99.730
0.05	3.99		1.55	87.89		3.05	99.771
0.10	7.97		1.60	89.04		3.10	99.806
0.15	11.92		1.65	90.11		3.15	99.837
0.20	15.85		1.70	91.09		3.20	99.863
0.25	19.74		1.75	91.99		3.25	99.885
0.30	23.58		1.80	92.81		3.30	99.903
0.35	27.37		1.85	93.57		3.35	99.919
0.40	31.08		1.90	94.26		3.40	99.933
0.45	34.73		1.95	94.88		3.45	99.944
0.50	38.29		2.00	95.45		3.50	99.953
0.55	41.77		2.05	95.96		3.55	99.961
0.60	45.15		2.10	96.43		3.60	99.968
0.65	48.43		2.15	96.84		3.65	99.974
0.70	51.61		2.20	97.22		3.70	99.978
0.75	54.67		2.25	97.56		3.75	99.982
0.80	57.63		2.30	97.86		3.80	99.986
0.85	60.47		2.35	98.12		3.85	99.988
0.90	63.19		2.40	98.36		3.90	99.990
0.95	65.79		2.45	98.57		3.95	99.992
1.00	68.27		2.50	98.76		4.00	99.9937
1.05	70.63		2.55	98.92		4.05	99.9949
1.10	72.87		2.60	99.07		4.10	99.9959
1.15	74.99		2.65	99.20		4.15	99.9967
1.20	76.99		2.70	99.31		4.20	99.9973
1.25	78.87		2.75	99.40		4.25	99.9979
1.30	80.64		2.80	99.49		4.30	99.9983
1.35	82.30		2.85	99.56		4.35	99.9986
1.40	83.85		2.90	99.63		4.40	99.9989
1.45	85.29		2.95	99.68		4.45	99.9991

Chi-Square Table



Degrees of freedom ↓	30%	10%	5%	1%	0.1%	← p-value
1	1.07	2.71	3.84	6.63	10.83	
2	2.41	4.61	5.99	9.21	13.82	
3	3.66	6.25	7.81	11.34	16.27	
4	4.88	7.78	9.49	13.28	18.47	
5	6.06	9.24	11.07	15.09	20.52	
6	7.23	10.64	12.59	16.81	22.46	
7	8.38	12.02	14.07	18.48	24.32	
8	9.52	13.36	15.51	20.09	26.12	
9	10.66	14.68	16.92	21.67	27.88	
10	11.78	15.99	18.31	23.21	29.59	
11	12.90	17.28	19.68	24.72	31.26	←Chi-square
12	14.01	18.55	21.03	26.22	32.91	
13	15.12	19.81	22.36	27.69	34.53	
14	16.22	21.06	23.68	29.14	36.12	
15	17.32	22.31	25.00	30.58	37.70	
16	18.42	23.54	26.30	32.00	39.25	
17	19.51	24.77	27.59	33.41	40.79	
18	20.60	25.99	28.87	34.81	42.31	
19	21.69	27.20	30.14	36.19	43.82	
20	22.77	28.41	31.41	37.57	45.31	
21	23.86	29.62	32.67	38.93	46.80	
22	24.94	30.81	33.92	40.29	48.27	
23	26.02	32.01	35.17	41.64	49.73	
24	27.10	33.20	36.42	42.98	51.18	

Critical Values for F distribution at p = 5% and p = 1%

F Distribution critical values for P=0.05

Denominator														
	Numerator DF													
DF	**1**	**2**	**3**	**4**	**5**	**7**	**10**	**15**	**20**	**30**	**60**	**120**	**500**	**1000**
1	161.45	199.50	215.71	224.58	230.16	236.77	241.88	245.95	248.01	250.10	252.20	253.25	254.06	254.19
2	18.513	19.000	19.164	19.247	19.296	19.353	19.396	19.429	19.446	19.462	19.479	19.487	19.494	19.495
3	10.128	9.5522	9.2766	9.1172	9.0135	8.8867	8.7855	8.7028	8.6602	8.6165	8.5720	8.5493	8.5320	8.5292
4	7.7086	6.9443	6.5915	6.3882	6.2560	6.0942	5.9644	5.8579	5.8026	5.7458	5.6877	5.6580	5.6352	5.6317
5	6.6078	5.7862	5.4095	5.1922	5.0504	4.8759	4.7351	4.6187	4.5582	4.4958	4.4314	4.3985	4.3731	4.3691
7	5.5914	4.7375	4.3469	4.1202	3.9715	3.7871	3.6366	3.5108	3.4445	3.3758	3.3043	3.2675	3.2388	3.2344
10	4.9645	4.1028	3.7082	3.4780	3.3259	3.1354	2.9782	2.8450	2.7741	2.6996	2.6210	2.5801	2.5482	2.5430
15	4.5431	3.6823	3.2874	3.0556	2.9013	2.7066	2.5437	2.4035	2.3275	2.2467	2.1601	2.1141	2.0776	2.0718
20	4.3512	3.4928	3.0983	2.8660	2.7109	2.5140	2.3479	2.2032	2.1241	2.0391	1.9463	1.8962	1.8563	1.8498
30	4.1709	3.3159	2.9223	2.6896	2.5336	2.3343	2.1646	2.0149	1.9317	1.8408	1.7396	1.6835	1.6376	1.6300
60	4.0012	3.1505	2.7581	2.5252	2.3683	2.1666	1.9927	1.8365	1.7480	1.6492	1.5343	1.4672	1.4093	1.3994
120	3.9201	3.0718	2.6802	2.4473	2.2898	2.0868	1.9104	1.7505	1.6587	1.5544	1.4289	1.3519	1.2804	1.2674
500	3.8601	3.0137	2.6227	2.3898	2.2320	2.0278	1.8496	1.6864	1.5917	1.4820	1.3455	1.2552	1.1586	1.1378
1000	3.8508	3.0047	2.6137	2.3808	2.2230	2.0187	1.8402	1.6765	1.5811	1.4705	1.3318	1.2385	1.1342	1.1096

F Distribution critical values for P=0.01

Denominator														
	Numerator DF													
DF	**1**	**2**	**3**	**4**	**5**	**7**	**10**	**15**	**20**	**30**	**60**	**120**	**500**	**1000**
1	4052.2	4999.5	5403.4	5624.6	5763.6	5928.4	6055.8	6157.3	6208.7	6260.6	6313.0	6339.4	6359.5	6362.7
2	98.503	99.000	99.166	99.249	99.299	99.356	99.399	99.433	99.449	99.466	99.482	99.491	99.497	99.498
3	34.116	30.817	29.457	28.710	28.237	27.672	27.229	26.872	26.690	26.504	26.316	26.221	26.148	26.137
4	21.198	18.000	16.694	15.977	15.522	14.976	14.546	14.198	14.020	13.838	13.652	13.558	13.486	13.474
5	16.258	13.274	12.060	11.392	10.967	10.455	10.051	9.7222	9.5526	9.3793	9.2020	9.1118	9.0424	9.0314
7	12.246	9.5467	8.4513	7.8466	7.4605	6.9929	6.6201	6.3143	6.1554	5.9920	5.8236	5.7373	5.6707	5.6601
10	10.044	7.5594	6.5523	5.9944	5.6363	5.2001	4.8492	4.5582	4.4055	4.2469	4.0818	3.9964	3.9303	3.9195
15	8.6831	6.3588	5.4169	4.8932	4.5557	4.1416	3.8049	3.5223	3.3719	3.2141	3.0471	2.9594	2.8906	2.8796
20	8.0960	5.8489	4.9382	4.4306	4.1027	3.6987	3.3682	3.0880	2.9377	2.7785	2.6078	2.5167	2.4446	2.4330
30	7.5624	5.3903	4.5098	4.0179	3.6990	3.3046	2.9791	2.7002	2.5486	2.3859	2.2078	2.1108	2.0321	2.0192
60	7.0771	4.9774	4.1259	3.6491	3.3388	2.9530	2.6318	2.3522	2.1978	2.0284	1.8362	1.7264	1.6328	1.6169
120	6.8509	4.7865	3.9490	3.4795	3.1736	2.7918	2.4720	2.1914	2.0345	1.8600	1.6557	1.5330	1.4215	1.4015
500	6.6858	4.6479	3.8210	3.3569	3.0539	2.6751	2.3564	2.0746	1.9152	1.7353	1.5175	1.3774	1.2317	1.2007
1000	6.6603	4.6264	3.8012	3.3379	3.0356	2.6571	2.3387	2.0564	1.8967	1.7158	1.4953	1.3513	1.1947	1.1586