MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question

e an appropriate response. 1) Given H ₀ : p ≥ 80% and H _a : ₁	p < 80%, determine whether t	he hypothesis test is left-tailed,	1)
right-tailed, or two-tailed.			
A) two-tailed	B) right-tailed	C) left-tailed	
2) A researcher claims that 62%	of voters favor gun control.	Determine whether the hypothesis test for	2)
this claim is left-tailed, right	-tailed, or two-tailed.		
A) left-tailed	B) right-tailed	C) two-tailed	
3) A car maker claims that its n	ew sub-compact car gets bett	er than 47 miles per gallon on the	3)
highway. Determine whethe	r the hypothesis test for this i	s left-tailed, right-tailed, or two-tailed.	
A) left-tailed	B) two-tailed	C) right-tailed	
4) An elementary school claims	s that the standard deviation i	n reading scores of its fourth grade	4)
students is less than 4.35. De	termine whether the hypothe	sis test for this claim is left–tailed,	
right-tailed, or two-tailed.			
A) right-tailed	B) left-tailed	C) two-tailed	
5) The mean age of bus drivers	in Chicago is greater than 57.	8 years. If a hypothesis test is performed,	5)
how should you interpret a	decision that rejects the null h	ypothesis?	
A) There is sufficient evid	ence to support the claim μ >	57.8.	
B) There is sufficient evid	ence to reject the claim $\mu > 57$.8.	
C) There is not sufficient e	evidence to support the claim	$\mu > 57.8.$	
D) There is not sufficient e	evidence to reject the claim μ :	> 57.8.	
6) The mean IQ of statistics tea	chers is greater than 150. If a l	hypothesis test is performed, how should	6)
you interpret a decision that	fails to reject the null hypothe	esis?	
A) There is sufficient evid	ence to support the claim $\mu >$	150.	
B) There is not sufficient e	evidence to support the claim	$\mu > 150.$	
C) There is not sufficient e	evidence to reject the claim μ	> 150.	
D) There is sufficient evid	ence to reject the claim $\mu > 15$	0.	
7) The dean of a major universi	ity claims that the mean time	for students to earn a Master's degree is at	7)
most 5.1 years. If a hypothes	is test is performed, how shou	ıld you interpret a decision that fails to	
reject the null hypothesis?			
A) There is sufficient evid	ence to support the claim $\mu \leq$	5.1.	
B) There is sufficient evid	ence to reject the claim $\mu \le 5.1$		
C) There is not sufficient e	evidence to support the claim	μ≤5.1.	
D) There is not sufficient e	evidence to reject the claim μ s	≤ 5.1.	
8) Given H ₀ : $\mu \le 12$, for which	confidence interval should yo	u reject H ₀ ?	8)
A) (10, 13)	B) (11.5, 12.5)	C) (13, 16)	-
/	, (,,	- / < - / /	
9) Given H ₀ : $p = 0.85$ and $\alpha = 0$.10, which level of confidence	should you use to test the claim?	9)
A > 000/	$\mathbf{D} = \mathbf{O} + $	D) 050/	

10) Suppose you are using $\alpha = 0.05$ to test the claim that $\mu \neq 14$ using a P-value. You are given the							
sample statistics $n = 35$	$\overline{5}$, $\overline{x} = 13.1$, and $s = 2.7$.	Find the P-value.					
A) 0.1003	B) 0.0488	C) 0.0591	D) 0.0244				
11) Suppose you are using	$g \alpha = 0.01$ to test the class	im that μ ≤ 32 using a P-valι	.e. You are given the	11)			
sample statistics $n = 40$	x = 33.8, and $s = 4.3.1$	Find the P-value.					
A) 0.0040	B) 0.9960	C) 0.1030	D) 0.0211				
12) Given H ₀ : $\mu \ge 18$ and I	P = 0.070. Do you reject	or fail to reject H_0 at the 0.0	5 level of significance?	12)			
A) not sufficient inf	ormation to decide						
B) reject H ₀							
C) fail to reject H_0							
13) Find the critical value	for a right-tailed test w	with $\alpha = 0.01$ and $n = 75$.		13)			
A) 2.33	B) 2.575	C) 1.96	D) 1.645				
,	,	,	,				
14) Find the critical value	for a left-tailed test wit	th $\alpha = 0.05$ and $n = 48$.		14)			
A) -2.575	B) -1.645	C) -1.96	D) -2.33	/			
15) Find the critical value	for a two-tailed test wi	a = 0.10 and n = 100.		15)			
A) ±2.575	B) ±1.96	C) ±2.33	D) ±1.645				
16) You wish to test the claim that $\mu \neq 22$ at a level of significance of $\alpha = 0.05$ and are given sample							
statistics n = 35, \overline{x} = 21	.1, and s = 2.7. Comput	te the value of the standardiz	zed test statistic. Round	/			
your answer to two de	ecimal places.						
A) -1.97	B) –1.83	C) -2.86	D) -3.12				
17) Suppose you want to t	test the claim that $\mu \neq 3$.	.5. Given a sample size of n =	= 47 and a level of	17)			
significance of $\alpha = 0.10$), when should you reje	ect H ₀ ?		·			
A) Reject H ₀ if the s	tandardized test statist	ic is greater than 2.575 or les	s than -2.575.				
B) Reject H ₀ if the s	tandardized test statist	ic is greater than 1.645 or les	s than –1.645.				
C) Reject H_0 if the s	tandardized test statist	ic is greater than 2.33 or less	than -2.33				
D) Reject H_0 if the s	tandardized test statist	ic is greater than 1.96 or less	than -1.96				
18) Suppose you want to t	test the claim that $\mu \ge 65$	5.4. Given a sample size of n	= 35 and a level of	18)			
significance of $\alpha = 0.05$	5, when should you reje	$ect H_0?$					
A) Reject H_0 if the s	tandardized test statist	ic is less than –2.575.					
B) Reject H ₀ if the s	tandardized test statist	ic is less than –1.28.					
C) Reject H_0 if the s	tandardized test is less	than – 1.96.					
D) Reject H ₀ if the s	tandardized test statist	ic is less than –1.645.					
19) Find the critical values	s for a sample with $n =$	15 and $\alpha = 0.05$ if H ₀ : $\mu \le 20$		19)			
A) 2.977	B) 1.761	C) 1.345	D) 2.625	/			
,	,	_ /	,				
20) Find the standardized	test statistic t for a sam	ple with $n = 10$, $\bar{x} = 9.7$, $s = 10$	1.3, and $\alpha = 0.05$ if	20)			
H_0 : μ ≥ 10.6. Round ye	our answer to three dec	rimal places.					
A) -2.617	B) -3.186	C) -2.189	D) -3.010				

21) Determine the critic $n - 48$	0,			
n = 40	x = 0.01			
A) ± 1.645	B) ±1.96	C) ±2.33	D) ±2.575	
)	,	-))	
22) Find the critical X^2	-value to test the claim σ^2	> 1.8 if n = 15 and $\alpha = 0.05$	5.	22)
A) 6.571	B) 5.629	C) 4.660	D) 4.075	
,	,	,	,	
23) Find the critical X^2	-value to test the claim σ^2	> 1.9 if n = 18 and $\alpha = 0.0^{\circ}$	1.	23)
A) 33.409	B) 27.587	C) 35.718	D) 30.181	
,	,	,	,	
24) Compute the stands $\alpha = 0.05$	ardized test statistic, X^2 , to	test the claim $\sigma^2 = 21.5$ if	$n = 12, s^2 = 18, and$	24)
A) 0.492	B) 9.209	C) 18.490	D) 12.961	
,	,	,	,	
25) Compute the stand	ardized test statistic X2 to	test the claim $\sigma^2 < 50.4$ if	$n = 28$, $s^2 = 31.5$ and	25)
$\alpha = 0.10$.	indized test statistic, X , to		$n = 20, 3^{\circ} = 01.5, and$	
A) 16.875	B) 14.324	C) 21.478	D) 18.132	
,	,	,	,	
T ANSWER. Write the 26) Test the claim that o normally distribute	word or phrase that best co $s^2 \ge 1.8$ if n = 15, $s^2 = 1.5$, a d.	completes each statement on $\alpha = 0.05$. Assume that t	or answers the question the population is 26) _	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 	word or phrase that best co $y^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 0 60 88 66 78 8	The properties of the set of the	or answers the question the population is 26) _ ics students and the 27) _ the data.	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 4 Scores, y 65 8 	word or phrase that best co $r^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 0 60 88 66 78 8	pompletes each statement of $\alpha = 0.05$. Assume that the randomly selected statistic construct a scatter plot for the state of $\frac{5}{5}$ of $\frac{6}{90}$ of $\frac{3}{71}$	or answers the question the population is 26) _ ics students and the 27) _ the data.	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 28) The data below are students from a students	word or phrase that best co $y^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 5 2 8 2 4 4 5 0 60 88 66 78 8 the number of absences ar	The provided state of	or answers the question the population is 26) _ ics students and the 27) _ the data.	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 28) The data below are students from a state 	word or phrase that best co $r^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 0 60 88 66 78 8 the number of absences ar istics class. Construct a sca	The provided state of the provided state of the provided statistics of the provided statistics and the final grades of 9 rangements of the provided state	or answers the question the population is 26) _ ics students and the 27) _ the data.	
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 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 4 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 	word or phrase that best co $r^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 0 60 88 66 78 8 the number of absences ar istics class. Construct a sca s, x = 0 3 6 4 98 86 80 82	ompletes each statement ofnd $\alpha = 0.05$. Assume that therandomly selected statisticonstruct a scatter plot for the 4 5 6 3 5 90 90 71 ad the final grades of 9 ranatter plot for the data. 9 2 15 8 5 71 9 2 15 8 5 71	or answers the question the population is 26) _ ics students and the 27) _ the data.	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 4 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 	word or phrase that best converse of $n^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and d. the final exam scores of 10 ey studied for the exam. Converse of $\frac{5}{2}$ $\frac{2}{8}$ $\frac{2}{2}$ $\frac{4}{4}$ $\frac{4}{60}$ $\frac{60}{60}$ $\frac{88}{66}$ $\frac{66}{78}$ $\frac{78}{8}$ the number of absences an existic class. Construct a scats $\frac{s}{8}$, x $\frac{0}{98}$ $\frac{3}{86}$ $\frac{6}{80}$ $\frac{4}{82}$	ompletes each statement ofnd $\alpha = 0.05$. Assume that therandomly selected statisticconstruct a scatter plot for the 4 5 6 3 5 90 90 71 ad the final grades of 9 ranatter plot for the data. 9 2 15 8 5 71 92 55 71 92 55 76 82	or answers the question the population is 26) _ ics students and the 27) _ the data. adomly selected 28) _	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 4 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 	word or phrase that best co $y^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C 5 2 8 2 4 4 0 60 88 66 78 8 the number of absences ar istics class. Construct a sca s, x 0 3 6 4 98 86 80 82	completes each statement ofand $\alpha = 0.05$. Assume that therandomly selected statisticconstruct a scatter plot for the 4 5 6 3 5 90 90 71 ad the final grades of 9 ranatter plot for the data. 9 2 15 8 5 71 92 55 71 92 55 76 82	or answers the question the population is 26) _ ics students and the 27) _ the data.	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 29) Calculate the coefficient 	word or phrase that best converse of $n^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and d. the final exam scores of 10 ey studied for the exam. C $5 \ 2 \ 8 \ 2 \ 4 \ 4$ $5 \ 2 \ 8 \ 66 \ 78 \ 8$ the number of absences arrivation is class. Construct a scarse is $x = 0 \ 3 \ 6 \ 4$ $98 \ 86 \ 80 \ 82$ cient of correlation, r, lettir	pompletes each statement of and $\alpha = 0.05$. Assume that the randomly selected statistic construct a scatter plot for the the final grades of 9 ran and the final grades of 9 ran atter plot for the data. 9 2 15 8 5 9 2 15 8 5 71 92 55 76 82	or answers the question the population is 26)	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 29) Calculate the coefficience of the student of the stude	word or phrase that best co $y^2 \ge 1.8$ if n = 15, s ² = 1.5, a d. the final exam scores of 10 ey studied for the exam. C $5 \ 2 \ 8 \ 2 \ 4 \ 6$ $5 \ 2 \ 8 \ 66 \ 78 \ 8$ the number of absences ar istics class. Construct a sca $s, x \ 0 \ 3 \ 6 \ 4$ $98 \ 86 \ 80 \ 82$ cient of correlation, r, lettir ues. Now calculate the coefficient of the scale of t	pompletes each statement of and $\alpha = 0.05$. Assume that the randomly selected statistic construct a scatter plot for the $\frac{1}{5}$ 6 3 $\frac{5}{90}$ 90 71 and the final grades of 9 ran after plot for the data. $\frac{9}{71}$ 2 15 8 5 71 92 55 76 82 and represent the x-x ficient of correlation, r, let	or answers the question the population is 26) ics students and the 27) the data. adomly selected 28) domly selected 28) values and Row 2 29) tting Row 2	
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 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 29) Calculate the coefficience represent the y-value represent the x-value explanatory and rest 	word or phrase that best converse of $n^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.5$, and $s^2 \ge 1.5$, and $s^2 \ge 1.5$, and $s^2 \ge 1.5$, $s^2 \ge 1.$	pompletes each statement of and $\alpha = 0.05$. Assume that the randomly selected statistic construct a scatter plot for the $\frac{1}{5}$ 6 3 $\frac{5}{90}$ 90 71 and the final grades of 9 ran after plot for the data. $\frac{9}{71}$ 2 15 8 5 71 92 55 76 82 and g Row 1 represent the x-we efficient of correlation, r, let the y-values. What effect data	or answers the question the population is 26) ics students and the 27) the data. adomly selected 28) domly selected 28) values and Row 2 29) tring Row 2 29) oes switching the	
 T ANSWER. Write the 26) Test the claim that on normally distribute 27) The data below are number of hours th Hours, x 3 3 Scores, y 65 28) The data below are students from a state Number of absence Final grade, y 29) Calculate the coefficience represent the y-value represent the x-value explanatory and rest of the student of the st	word or phrase that best converses of $n^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.8$ if $s^2 \ge$	pompletes each statement of and $\alpha = 0.05$. Assume that if randomly selected statistic construct a scatter plot for if $\frac{1}{5}$ 6 3 $\frac{5}{90}$ 90 71 ad the final grades of 9 ran after plot for the data. $\frac{9}{2}$ 15 8 5 71 92 55 76 82 ag Row 1 represent the x-with ficient of correlation, r, let be y-values. What effect do be correlation coefficient?	or answers the question the population is 26)	
 T ANSWER. Write the 26) Test the claim that of normally distribute 27) The data below are number of hours th Hours, x 3 4 Scores, y 65 8 28) The data below are students from a state Number of absence Final grade, y 29) Calculate the coefficience represent the y-value represent the x-value explanatory and rest in the final grade of the final grade	word or phrase that best converses of $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 = 1.5$, and $s^2 \ge 1.8$ if $n = 15$, $s^2 \ge 1.8$ if	pompletes each statement of and $\alpha = 0.05$. Assume that the randomly selected statistic construct a scatter plot for the assume the final grades of 9 ran atter plot for the data. $\begin{vmatrix} 9 & 2 & 15 & 8 & 5 \\ \hline 71 & 92 & 55 & 76 & 82 \\ \hline 71 & 92 & 55 & 76 & 82 \\ \hline q Row 1 represent the x-verticent of correlation, r, leftthe y-values. What effect donot correlation coefficient?\begin{vmatrix} 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 10 & 12 & 15 \\ \hline 0 & 1 & -6 \\ \hline 0 &$	or answers the question the population is 26)	

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question

30) Find the equation of the regression line for the given data.

x	-5	-3	4	1	-1	-2	0	2	3	-4	
у	-10	-8	9	1	-2	-6	-1	3	6	-8	
					•			•		•	
A	$\hat{y} =$	2.092	7x +	0.55	52						B) $\hat{y} = 2.097x - 0.552$
C	$\hat{y} =$	0.522	2x -	2.09	97						D) $\hat{y} = -0.552x + 2.097$

Hours, x	3	5	2	8	2	4	4	5	6	3	
Scores, y	65	80	60	88	66	78	85	90	90	71	
						•					
A) $\hat{y} = 5.044x + 56.113$									B) v	= -5	6.113x - 5.044
C) x = 56113x = 5.044										5	$0.44 \times \pm 56113$
A) $\hat{y} = 5.0$					B) y ^	= -5	6.113x - 5.044 044x + 56 113				

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

32) The frequency distribution shows the ages for a sample of 100 employees. Find the expected frequencies for each class to determine if the employee ages are normally distributed.

32) _____

Class boundaries	Frequency, f
29.5-39.5	14
39.5-49.5	29
49.5-59.5	31
59.5-69.5	18
69.5-79.5	8

33) A new coffeehouse wishes to see whether customers have any preference among 5 different brands of coffee. A sample of 200 customers provided the data below. Test the claim that the distribution is uniform. Use $\alpha = 0.01$.

33) _____

Brand12345Customers1832553065

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question

34) _____ 34) A teacher figures that final grades in the statistics department are distributed as: A, 25%; B, 25%; C, 40%; D, 5%; F, 5%. At the end of a randomly selected semester, the following number of grades

were recorded. Find the critical value χ^2_0 to determine if the grade distribution for the department

is different than expected. Use $\alpha = 0.01$.

Grade	Α	В	С	D	F		
Number	42	36	60	8	14		
A) 9.48	88				B) 13.277	C) 7.779	D) 11.143

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

Perform the indicated goodness-of-fit test.

35) You roll a die 48 times with the following results.

Number	1	2	3	4	5	6
Frequency	3	13	4	2	14	12

Use a significance level of 0.05 to test the claim that the die is fair.

36) In studying the responses to a multiple-choice test question, the following sample data were obtained. At the 0.05 significance level, test the claim that the responses occur with the same frequency.

36) ____

Response	Α	В	С	D	Ε	_
Frequency	12	15	16	18	19	-

35) _____

Answer Key Testname: STATS-3-REVIEW

2) C 3) C 4) B 5) A 6) B 7) D 8) C 9) B 10) B 11) A 12) C 13) A 14) B 15) D 16) A 17) B 18) D

1) C

10) D 19) B

20) C

21) D

22) A

23) A

24) B

25) A

26) critical value X $_0^2 = 6.571$; standardized test statistic X² \approx 11.667; fail to reject H₀; There is not sufficient evidence to

reject the claim. 27)



Answer Key Testname: STATS-3-REVIEW



- 29) The correlation coefficient remains unchanged.
- 30) B
- 31) A
- 32) 11, 26, 32, 21, and 7, respectively.
- 33) critical value $\chi_0^2 = 13.277$; chi–square test statistic $\chi^2 \approx 37.45$; reject H₀; There is sufficient evidence to reject the claim

that the distribution is uniform.

34) B

35) H₀: The die is fair (all numbers occur with equal frequency).

H₁: The die is not fair.

Test statistic: $\chi^2 = 19.25$. Critical value: $\chi^2 = 11.070$. Reject the null hypothesis. There is sufficient evidence to warrant rejection of the claim that the die is fair.

36) H₀: The proportions of responses are all equal.

H₁: The proportions of responses are not all equal.

Test statistic: $\chi^2 = 1.875$. Critical value: $\chi^2 = 9.488$. Fail to reject the null hypothesis. There is not sufficient evidence to warrant rejection of the claim that the responses occur with the same frequency.