Score: 7.87/27 Points 29.15 %

1. Award: **1 out of 1.00 point**

You did not receive full credit for this question in a previous attempt

The χ^2 statistic is used to test whether the assumption of normality is reasonable for a given population distribution. The sample consists of 5,000 observations and is divided into 6 categories (intervals). The degrees of freedom for the chi-square statistic are

- ○ 4,999.
- ○ 6.
- ○ 5.
- ○ 4.
- ✓ ● 3.

Degrees of freedom = $k - 3$, where k = number of intervals. Thus, $df = 6 - 3 = 3$

References

Multiple Choice	Learning Objective: 12-02 Perform a goodness-of-fit test for normality.

2.

Award: **0 out of 1.00 point**

⊗ You did not receive full credit for this question in a previous attempt

A manufacturing company produces part QV2Y for the aerospace industry. This particular part can be manufactured using 3 different production processes. The management wants to know if the quality of the units of part QV2Y is the same for all three processes. The production supervisor obtained the following data: Process 1 had 29 defective units in 240 items, Process 2 produced 12 defective units in 180 items, and Process 3 manufactured 9 defective units in 150 items. At a significance level of .05, the management wants to perform a hypothesis test to determine whether the quality of items produced appears to be independent of the production process used. What is the rejection point condition?

○ Reject H_0 if $\chi^2 > .10257$

⊗ ● Reject H_0 if $\chi^2 > 9.3484$

→ ○ Reject H_0 if $\chi^2 > 5.99147$

○ Reject H_0 if $\chi^2 > 7.37776$

○ Reject H_0 if $\chi^2 > 7.81473$

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

3.

Award: **0.75 out of 3.00 points**

⊗ You did not receive full credit for this question in a previous attempt

The shares of the U.S. automobile market held in 1990 by General Motors, Japanese manufacturers, Ford, Chrysler, and other manufacturers were, respectively, 36%, 30%, 21%, 9%, and 4%. Suppose that a new survey of 1,000 new-car buyers shows the following purchase frequencies:

GM	Japanese	Ford	Chrysler	Other
380	253	262	68	37

(a) Show that it is appropriate to carry out a chi-square test using these data and calculate the value of the test statistic.

Each expected value is ≥ **1** ✗

x^2 **1.000** ✗

(b) Test to determine whether the current market shares differ from those of 1990. Use α = .05. **(Round your answer to 3 decimal places.)**

Reject ✓ H_0 . Conclude current market shares **do not differ** ✗ from those of 1990.

rev: 01_02_2019_QC_CS-152394

References

Worksheet	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

The shares of the U.S. automobile market held in 1990 by General Motors, Japanese manufacturers, Ford, Chrysler, and other manufacturers were, respectively, 36%, 30%, 21%, 9%, and 4%. Suppose that a new survey of 1,000 new-car buyers shows the following purchase frequencies:

GM	Japanese	Ford	Chrysler	Other
380	253	262	68	37

(a) Show that it is appropriate to carry out a chi-square test using these data and calculate the value of the test statistic.

Each expected value is ≥ 5

x^2 26.953 ± 0.001

(b) Test to determine whether the current market shares differ from those of 1990. Use α = .05. **(Round your answer to 3 decimal places.)**

Reject ✓ H_0 . Conclude current market shares differ ✓ from those of 1990.

rev: 01_02_2019_QC_CS-152394

Explanation:

(b)

$$\chi^2 = \Sigma\left(\frac{(380-360)^2}{360} + \frac{(253-300)^2}{300} + \frac{(262-210)^2}{210} + \frac{(68-90)^2}{90} + \frac{(37-40)^2}{40}\right) = 26.953$$

$\chi^2_{.05} = 9.488$

Since 26.953 > 9.488, reject H_0. the current market shares differ from those of 1990.

4.

Award: **0 out of 1.00 point**

⊗ You did not receive full credit for this question in a previous attempt

The number of degrees of freedom associated with a chi-square test for independence based upon a contingency table with 4 rows and 3 columns is ______.

- ○ 7
- ✗ ● 12
- ○ 5
- → ○ 6

$df = (4 - 1)(3 - 1) = 6$

References

Multiple Choice	Learning Objective: 12-02 Perform a goodness-of-fit test for normality.

5.

Award: **0.12 out of 3.00 points**

⊗ You did not receive full credit for this question in a previous attempt

In the book *Business Research Methods* (5th ed.), Donald R. Cooper and C. William Emory discuss studying the relationship between on-the-job accidents and smoking. Cooper and Emory describe the study as follows:

Suppose a manager implementing a smoke-free workplace policy is interested in whether smoking affects worker accidents. Since the company has complete reports of on-the-job accidents, she draws a sample of names of workers who were involved in accidents during the last year. A similar sample from among workers who had no reported accidents in the last year is drawn. She interviews members of both groups to determine if they are smokers or not.

The sample results are given in the following table.

	On-the-Job Accident		
Smoker	Yes	No	Row Total
Heavy	11	5	16
Moderate	5	9	14
Nonsmoker	18	18	36
Column total	34	32	66

Expected counts are below observed counts

	Accident	No Accident	Total
Heavy	11	5	16
	8.24	7.76	
Moderate	5	9	14
	7.21	6.79	
Nonsmoker	18	18	36
	18.55	17.45	
Total	34	32	66

Chi-Sq = 3.34, DF = 2, P-Value = 0.188

(a) For each row and column total in the above table, find the corresponding row/column percentage. **(Round your answers to 2 decimal places.)**

Row 1	**1.00** ⊗ %
Row 2	**2.00** ⊗ %
Row 3	**3.00** ⊗ %
Column 1	**4.00** ⊗ %
Column 2	**5.00** ⊗ %

(b) For each cell in the above table, find the corresponding cell, row, and column percentages. **(Round your answers to 2 decimal places.)**

	Accident	No Accident
Heavy	Cell= **1.00** ⊗ %	Cell= **2.00** ⊗ %
	Row= **3.00** ⊗ %	Row= **4.00** ⊗ %
	Column= **5.00** ⊗ %	Column= **6.00** ⊗ %
Moderate	Cell= **7.00** ⊗ %	Cell= **8.00** ⊗ %
	Row= **9.00** ⊗ %	Row= **1.00** ⊗ %
	Column= **2.00** ⊗ %	Column= **3.00** ⊗ %
Nonsmoker	Cell= **4.00** ⊗ %	Cell= **5.00** ⊗ %
	Row= **6.00** ⊗ %	Row= **7.00** ⊗ %
	Column= **2** ⊗ %	Column= **2.00** ⊗ %

(c) Use the MINITAB output in the above to test the hypothesis that the incidence of on-the-job accidents is independent of smoking habits. Set α = .01.

Do not reject ✓ H_0.

(d) Is there a difference in on-the-job accident occurrences between smokers and nonsmokers?

Conclude there is **difference** ✗ between smokers and nonsmokers.

References

Worksheet Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

In the book *Business Research Methods* (5th ed.), Donald R. Cooper and C. William Emory discuss studying the relationship between on-the-job accidents and smoking. Cooper and Emory describe the study as follows:

Suppose a manager implementing a smoke-free workplace policy is interested in whether smoking affects worker accidents. Since the company has complete reports of on-the-job accidents, she draws a sample of names of workers who were involved in accidents during the last year. A similar sample from among workers who had no reported accidents in the last year is drawn. She interviews members of both groups to determine if they are smokers or not.

The sample results are given in the following table.

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Column total	34	32	66

```
          Expected counts are below observed counts
                    Accident      No Accident        Total
Heavy                 11               5               16
                     8.24            7.76
Moderate               5               9               14
```

```
                  7.21          6.79
Nonsmoker           18            18          36
                 18.55         17.45
Total               34            32          66
        Chi-Sq = 3.34, DF = 2, P-Value = 0.188
```

(a) For each row and column total in the above table, find the corresponding row/column percentage. **(Round your answers to 2 decimal places.)**

Row 1	*24.24* %
Row 2	*21.21* %
Row 3	*54.55* %
Column 1	*51.52* %
Column 2	*48.49* %

(b) For each cell in the above table, find the corresponding cell, row, and column percentages. **(Round your answers to 2 decimal places.)**

	Accident		No Accident	
Heavy	Cell=	*16.67* %	Cell=	*7.58* %
	Row=	*68.75* %	Row=	*31.25* %
	Column=	*32.35* %	Column=	*15.63* %
Moderate	Cell=	*7.58* %	Cell=	*13.64* %
	Row=	*35.71* %	Row=	*64.29* %
	Column=	*14.71* %	Column=	*28.13* %
Nonsmoker	Cell=	*27.27* %	Cell=	*27.27* %
	Row=	*50.00* %	Row=	*50.00* %
	Column=	*52.94* %	Column=	*56.25* %

(c) Use the MINITAB output in the above to test the hypothesis that the incidence of on-the-job accidents is independent of smoking habits. Set α = .01.

Do not reject ✓ H_0.

(d) Is there a difference in on-the-job accident occurrences between smokers and nonsmokers?

Conclude there is no difference ✓ between smokers and nonsmokers.

Explanation:

(c)

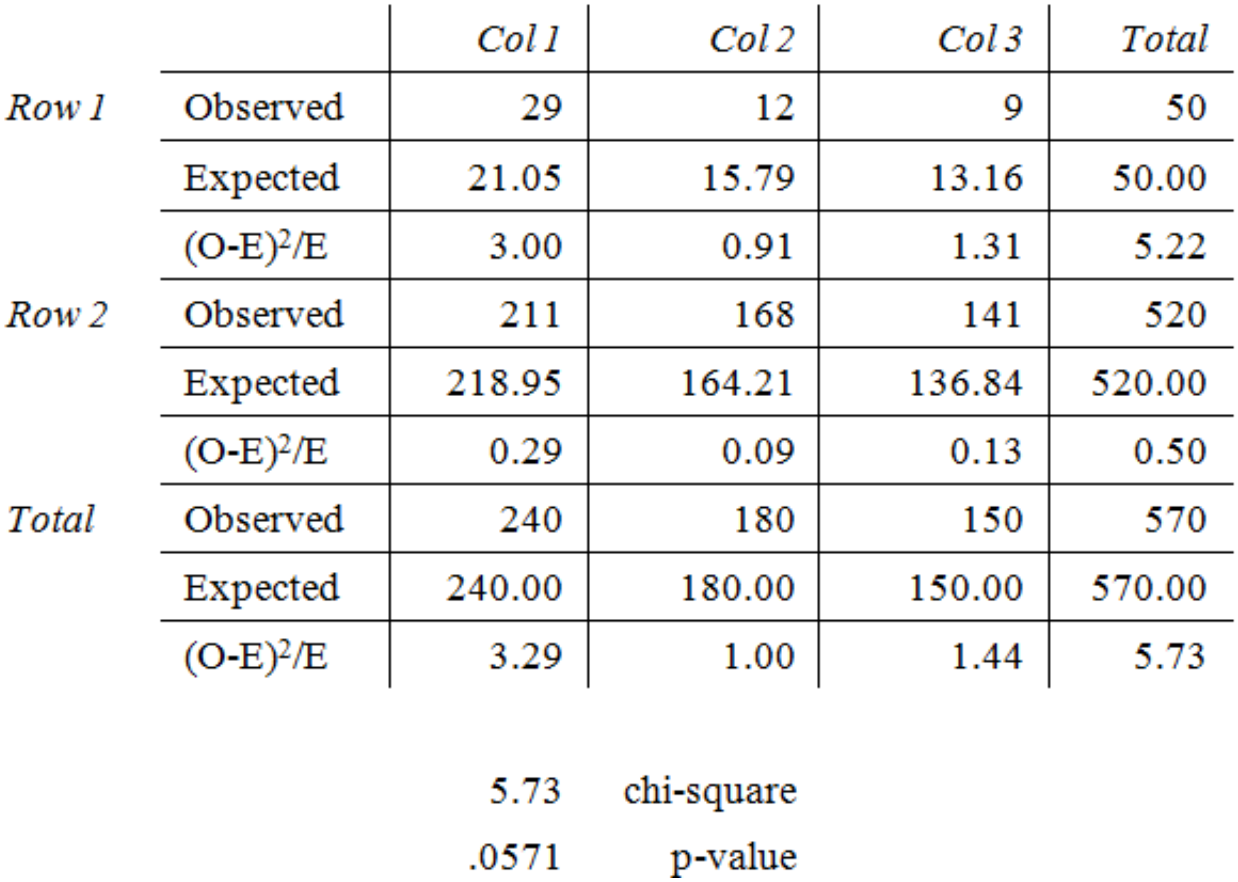
χ^2 = 3.34 *p*-value= .188, cannot reject H_0 at .01 level

(d)
Because p-value is greater than any common level of alpha, conclude no difference exists at alpha of .10, .05, .01 and .001.

6. Award: **1 out of 1.00 point**

✓ You received credit for this question in a previous attempt

A manufacturing company produces part QV2Y for the aerospace industry. This particular part can be manufactured using 3 different production processes. The management wants to know if the quality of the units of part QV2Y is the same for all three processes. The production supervisor obtained the following data: Process 1 had 29 defective units in 240 items, Process 2 produced 12 defective units in 180 items, and Process 3 manufactured 9 defective units in 150 items.
Chi-Square Contingency Table Test for Independence



		Col 1	*Col 2*	*Col 3*	*Total*
Row 1	Observed	29	12	9	50
	Expected	21.05	15.79	13.16	50.00
	$(O-E)^2/E$	3.00	0.91	1.31	5.22
Row 2	Observed	211	168	141	520
	Expected	218.95	164.21	136.84	520.00
	$(O-E)^2/E$	0.29	0.09	0.13	0.50
Total	Observed	240	180	150	570
	Expected	240.00	180.00	150.00	570.00
	$(O-E)^2/E$	3.29	1.00	1.44	5.73

5.73 chi-square
.0571 p-value

At a significance level of .10, the management wants to perform a hypothesis test to determine if the quality of the items produced appears to be independent of the production process used. Based on the results summarized in the MegaStat/Excel output provided in the table above, we

○ do not reject H_0 and conclude that the quality of the product is not the same for all processes.

✓ ● reject H_0 and conclude that the quality of the product is dependent on the manufacturing process.

○ do not reject H_0, and conclude that the quality of the product does not significantly differ among the three processes.

○ reject H_0 and conclude that the quality of the product is independent of the production process utilized.

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

7. Award: **1 out of 1.00 point**

☒ You did not receive full credit for this question in a previous attempt

The chi-square goodness-of-fit is __________ a one-tailed test with the rejection region in the right tail.

✓ ● always

○ sometimes

○ never

References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

8. Award: **0 out of 3.00 points**

⊗ You did not receive full credit for this question in a previous attempt

A television station wishes to study the relationship between viewership of its 11 p.m. news program and viewer age (18 years or less, 19 to 35, 36 to 54, 55 or older). A sample of 250 television viewers in each age group is randomly selected, and the number who watch the station's 11 p.m. news is found for each sample. The results are given in the table below.

	Age Group				
Watch 11 p.m. News?	18 or less	19 to 35	36 to 54	55 or Older	Total
Yes	42	57	61	82	242
No	208	193	189	168	758
Total	250	250	250	250	1,000

(a) Let p_1, p_2, p_3, and p_4 be the proportions of all viewers in each age group who watch the station's 11 p.m. news. If these proportions are equal, then whether a viewer watches the station's 11 p.m. news is independent of the viewer's age group. Therefore, we can test the null hypothesis H_0 that p_1, p_2, p_3, and p_4 are equal by carrying out a chi-square test for independence. Perform this test by setting α = .05. **(Round your answer to 3 decimal places.)**

χ^2 = **1.000** ⊗

so **Do not reject** ⊗ H_0: independence

(b) Compute a 95 percent confidence interval for the difference between p_1 and p_4. **(Round your answers to 3 decimal places. Negative amounts should be indicated by a minus sign.)**

95% CI: [**1.000** ⊗ , **1.000** ⊗]

References

Worksheet Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

A television station wishes to study the relationship between viewership of its 11 p.m. news program and viewer age (18 years or less, 19 to 35, 36 to 54, 55 or older). A sample of 250 television viewers in each age group is randomly selected, and the number who watch the station's 11 p.m. news is found for each sample. The results are given in the table below.

Watch 11 p.m. News?	Age Group 18 or less	19 to 35	36 to 54	55 or Older	Total
Yes	42	57	61	82	242
No	208	193	189	168	758
Total	250	250	250	250	1,000

(a) Let p_1, p_2, p_3, and p_4 be the proportions of all viewers in each age group who watch the station's 11 p.m. news. If these proportions are equal, then whether a viewer watches the station's 11 p.m. news is independent of the viewer's age group. Therefore, we can test the null hypothesis H_0 that p_1, p_2, p_3, and p_4 are equal by carrying out a chi-square test for independence. Perform this test by setting α = .05. **(Round your answer to 3 decimal places.)**

χ^2 = *17.815 ± .002*

so Reject ✓ H_0: independence

(b) Compute a 95 percent confidence interval for the difference between p_1 and p_4. **(Round your answers to 3 decimal places. Negative amounts should be indicated by a minus sign.)**

95% CI: [*-0.234 ± .001* , *-0.086 ± .001*]

Explanation:

(a)

$$\chi^2 = \frac{(42-60.5)^2}{60.5} + \frac{(57-60.5)^2}{60.5} + \frac{(61-60.5)^2}{60.5} + \frac{(82-60.5)^2}{60.5} + \frac{(208-189.5)^2}{189.5} + \frac{(193-189.5)^2}{189.5} + \frac{(189-189.5)^2}{189.5} + \frac{(168-189.5)^2}{189.5} = 17.815\chi^2_{.05} = 7.815$$ with 3 degrees of freedom

(b)

$$(0.168 - 0.328) \pm 1.96\sqrt{\frac{0.168(0.832)}{250} + \frac{0.328(0.672)}{250}} = -0.160 \pm 0.0744 = [-0.234,\ -0.086]$$

9. Award: **0 out of 1.00 point**

✗ You did not receive full credit for this question in a previous attempt

The chi-square goodness-of-fit test for multinomial probabilities with 5 categories has ______ degrees of freedom.

○ 5

→ ○ 4

○ 3

✗ ● 6

5 − 1 = 4

References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

10.

Award: **0 out of 1.00 point**

✗ You did not receive full credit for this question in a previous attempt

When we carry out a chi-square test of independence, as the differences between the respective observed and expected frequencies decrease, the probability of concluding that the row variable is independent of the column variable

- ○ decreases.
- → ○ increases.
- ✗ ● may decrease or increase depending on the number of rows and columns.
- ○ will be unaffected.

When a chi-square test for independence is large (observed frequencies differ substantially from the expected frequencies), then doubt will be cast on the null hypothesis of independence. Therefore, a small difference will result in a small chi-square and lowers the likelihood of rejecting the null hypothesis of independence.

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

11.

Award: **1 out of 1.00 point**

✖ You did not receive full credit for this question in a previous attempt

Which, if any, of the following statements about the chi-square test of independence is false?

- ○ If r_i is the row total for row i and c_j is the column total for column j, then the estimated expected cell frequency corresponding to row i and column j equals $(r_i)(c_j)/n$.
- ○ The test is valid if all of the estimated cell frequencies are at least five.
- ○ The chi-square statistic is based on $(r - 1)(c - 1)$ degrees of freedom, where r and c denote, respectively, the number of rows and columns in the contingency table.
- ✓ ● The alternative hypothesis states that the two classifications are statistically independent.
- ○ All of the other statements about the chi-square test of independence are true.

The alternative hypothesis states that the two classifications are dependent.

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

12. Award: **0 out of 1.00 point**

✗ You did not receive full credit for this question in a previous attempt

The χ^2 statistic from a contingency table with 6 rows and 5 columns will have

○ 30 degrees of freedom.

○ 24 degrees of freedom.

○ 5 degrees of freedom.

→ ○ 20 degrees of freedom.

✗ ● 25 degrees of freedom.

Degrees of freedom = (6 − 1)(5 − 1) = 5 × 4 = 20

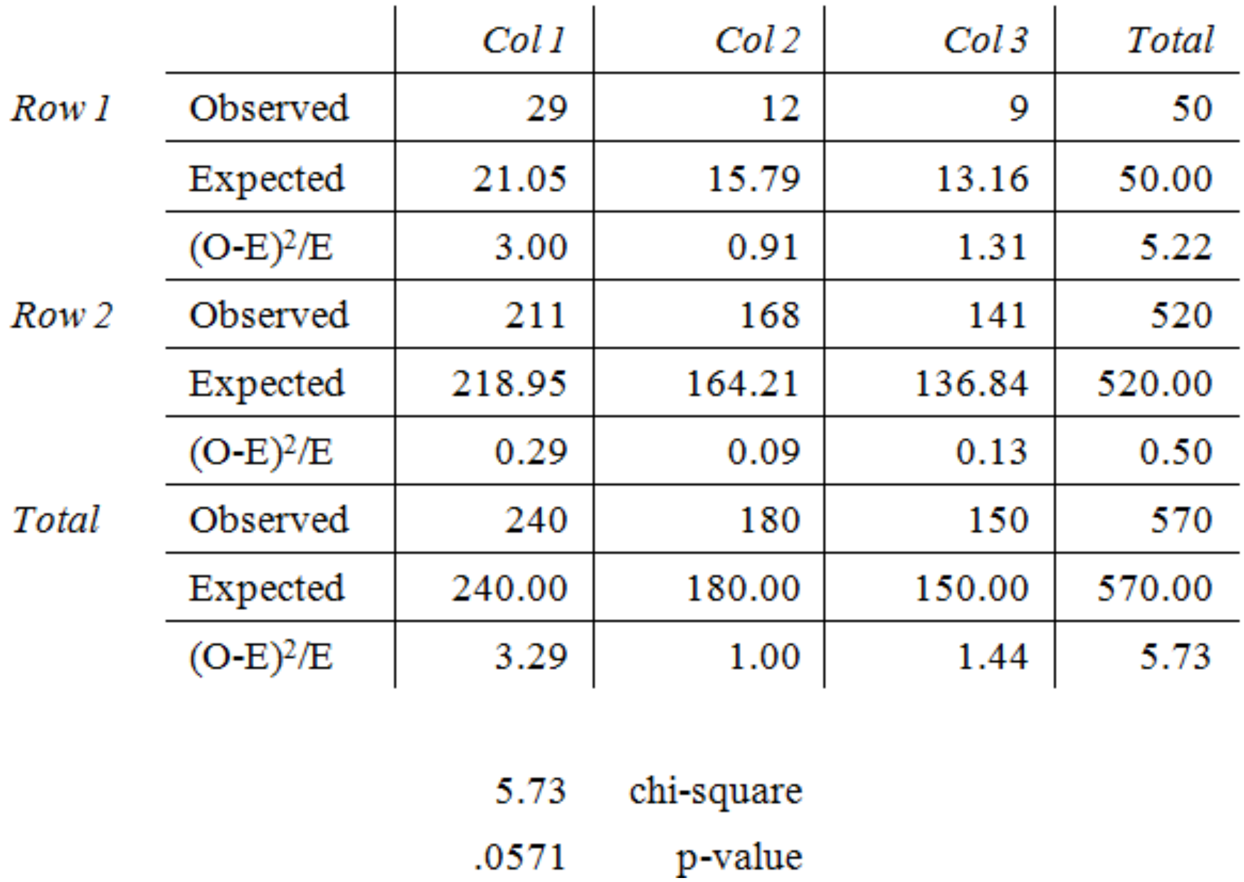
References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

13. Award: **1 out of 1.00 point**

✓ You received credit for this question in a previous attempt

A manufacturing company produces part QV2Y for the aerospace industry. This particular part can be manufactured using 3 different production processes. The management wants to know if the quality of the units of part QV2Y is the same for all three processes. The production supervisor obtained the following data: Process 1 had 29 defective units in 240 items, Process 2 produced 12 defective units in 180 items, and Process 3 manufactured 9 defective units in 150 items.
Chi-Square Contingency Table Test for Independence



		Col 1	*Col 2*	*Col 3*	*Total*
Row 1	Observed	29	12	9	50
	Expected	21.05	15.79	13.16	50.00
	$(O-E)^2/E$	3.00	0.91	1.31	5.22
Row 2	Observed	211	168	141	520
	Expected	218.95	164.21	136.84	520.00
	$(O-E)^2/E$	0.29	0.09	0.13	0.50
Total	Observed	240	180	150	570
	Expected	240.00	180.00	150.00	570.00
	$(O-E)^2/E$	3.29	1.00	1.44	5.73

5.73	chi-square
.0571	p-value

At a significance level of .05, the management wants to perform a hypothesis test to determine if the quality of the items produced appears to be independent of the production process used. Based on the results summarized in the MegaStat/Excel output provided in the table above, we

- ○ reject H_0 and conclude that the quality of the product is not the same for all processes.
- ○ reject H_0 and conclude that the quality of the product is dependent on the manufacturing process.
- ✓ ● do not reject H_0, and conclude that the quality of the product does not significantly differ among the three processes.
- ○ do not reject H_0, and conclude that the quality of the product is not the same for all processes.
- ○ reject H_0 and conclude that the quality of the product is independent of the manufacturing process used.

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

14. Award: **0 out of 1.00 point**

✖ You did not receive full credit for this question in a previous attempt

A manufacturing company produces part QV2Y for the aerospace industry. This particular part can be manufactured using 3 different production processes. The management wants to know if the quality of the units of part QV2Y is the same for all three processes. The production supervisor obtained the following data: Process 1 had 29 defective units in 240 items, Process 2 produced 12 defective units in 180 items, and Process 3 manufactured 9 defective units in 150 items. At a significance level of .05, we performed a chi-square test of independence to determine if the quality of the items produced appears to be independent of the production process. What are the degrees of freedom for the chi-square statistic?

→ ○ 2

○ 3

✖ ● 50

○ 520

○ 570

Degrees of freedom = $(r - 1)(c - 1) = 2 \times 1 = 2$, where r = no. of processes; and c = no. of categories, i.e., "defective" and "nondefective."

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

15. Award: **0 out of 1.00 point**

✗ You did not receive full credit for this question in a previous attempt

The chi-square goodness-of-fit test will be valid if the average of the expected cell frequencies is ____________.

○ greater than 0

○ less than 5

○ between 0 and 5

✗ ● at least 1

→ ○ at least 5

This is based on the concept of the sample size, *n*, being large. The sample size, *n*, is considered large if all of the expected cell frequencies are at least 5.

References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

16. Award: **0 out of 1.00 point**

✗ You did not receive full credit for this question in a previous attempt

A manufacturing company produces part QV2Y for the aerospace industry. This particular part can be manufactured using 3 different production processes. The management wants to know if the quality of the units of part QV2Y is the same for all three processes. The production supervisor obtained the following data: Process 1 had 29 defective units in 240 items, Process 2 produced 12 defective units in 180 items, and Process 3 manufactured 9 defective units in 150 items. At a significance level of .05, we performed a chi-square test to determine whether the quality of the items produced appears to be the same for all three processes. What is the null hypothesis?

→ ○ H_0: The number of defectives produced is independent of the production process used.

○ H_0: The row and column variables are associated with each other.

○ H_0: The proportion of defective units produced by the three production processes is the same.

✗ ● Both "H_0: The number of defectives produced is independent of the production process used." and "H_0: The proportion of defective units produced by the three production processes is the same." are correct or at least acceptable ways of stating the null hypothesis.

○ All of the other choices are acceptable ways of stating the null hypothesis.

References

Multiple Choice	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

17. Award: **0 out of 3.00 points**

✗ You did not receive full credit for this question in a previous attempt

A marketing research firm wishes to study the relationship between wine consumption and whether a person likes to watch professional tennis on television. One hundred randomly selected people are asked whether they drink wine and whether they watch tennis. The following results are obtained:

	Watch Tennis	Do Not Watch Tennis	Totals
Drink Wine	9	28	37
Do Not Drink Wine	11	52	63
Totals	20	80	100

(a) For each row and column total, calculate the corresponding row or column percentage.

Row 1	**n/r** ⊗%
Row 2	**n/r** ⊗%
Column 1	**n/r** ⊗%
Column 2	**n/r** ⊗%

(b) For each cell, calculate the corresponding cell, row, and column percentages. **(Round your answers to the nearest whole number.)**

	Watch Tennis	Do Not Watch Tennis
Drink Wine	Cell= **n/r** ⊗%	Cell= **n/r** ⊗%
	Row= **n/r** ⊗%	Row= **n/r** ⊗%
	Column= **n/r** ⊗%	Column= **n/r** ⊗%
Do Not Drink Wine	Cell= **n/r** ⊗%	Cell= **n/r** ⊗%
	Row= **n/r** ⊗%	Row= **n/r** ⊗%
	Column= **n/r** ⊗%	Column= **n/r** ⊗%

(c) Test the hypothesis that whether people drink wine is independent of whether people watch tennis. Set α = .05. **(Round your answer to 3 decimal places.)**

χ^2 = **n/r** ⊗

n/r ⊗ H_0. Conclude that whether a person drinks wine and whether a person watches tennis are **n/r** ⊗ events.

References

Worksheet	Learning Objective: 12-03 Decide whether two qualitative variables are independent by using a chi-square test for independence.

A marketing research firm wishes to study the relationship between wine consumption and whether a person likes to watch professional tennis on television. One hundred randomly selected people are asked whether they drink wine and whether they watch tennis. The following results are obtained:

	Watch Tennis	Do Not Watch Tennis	Totals
Drink Wine	9	28	37
Do Not Drink Wine	11	52	63
Totals	20	80	100

(a) For each row and column total, calculate the corresponding row or column percentage.

Row 1	*37*	%
Row 2	*63*	%
Column 1	*20*	%
Column 2	*80*	%

(b) For each cell, calculate the corresponding cell, row, and column percentages. **(Round your answers to the nearest whole number.)**

		Watch Tennis			Do Not Watch Tennis	
Drink Wine	Cell=	*9*	%	Cell=	*28*	%
	Row=	*24*	%	Row=	*76*	%
	Column=	*45*	%	Column=	*35*	%
Do Not Drink Wine	Cell=	*11*	%	Cell=	*52*	%
	Row=	*17*	%	Row=	*83*	%
	Column=	*55*	%	Column=	*65*	%

(c) Test the hypothesis that whether people drink wine is independent of whether people watch tennis. Set α = .05. **(Round your answer to 3 decimal places.)**

χ^2 = *.686 ± 0.001*

Do not reject ✓ H_0. Conclude that whether a person drinks wine and whether a person watches tennis are Independent ✓ events.

Explanation:

(c)

$$\chi^2 = \frac{(9-7)^2}{7} + \frac{(28-30)^2}{30} + \frac{(11-13)^2}{13} + \frac{(52-50)^2}{50}$$

= 0.346 + 0.086 + 0.203 + 0.051 = 0.686

H_0: whether a person drinks wine and whether a person watches tennis are dependent versus H_a: independent. Since .686 < $\chi^2_{.05}$ = 3.84146 (with (2 – 1)(2 – 1) = 1 degree of freedom), we do not reject H_0. Conclude independent.

18.

Award: **1 out of 1.00 point**

✓ You received credit for this question in a previous attempt

In performing a chi-square goodness-of-fit test with multinomial probabilities, the ____________ the difference between observed and expected frequencies, the higher the probability of concluding that the probabilities specified in the null hypothesis are correct.

○ larger

✓ ● smaller

References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.

19. Award: **1 out of 1.00 point**

✓ You received credit for this question in a previous attempt

An experiment consists of 400 observations and four mutually exclusive groups. If the probability of a randomly selected item being classified into any of the four groups is equal, then the expected number of items that will be classified into group 1 is ______.

- ○ 25
- ✓ ● 100
- ○ 125
- ○ 150

(.25)(400) = 100

References

Multiple Choice	Learning Objective: 12-01 Test hypotheses about multinomial probabilities by using a chi-square goodness-of-fit test.