

Contents

1	Sample Size, Mean, Standard Deviation, and Standard Error of the Mean	1
1.1	Mean	1
1.2	Standard Deviation	2
1.3	Standard Error of the Mean	3
1.4	Sample Size, Mean, Standard Deviation, and Standard Error of the Mean	4
1.4.1	Using the Fill/Series/Columns Commands	4
1.4.2	Changing the Width of a Column	5
1.4.3	Centering Information in a Range of Cells	6
1.4.4	Naming a Range of Cells	8
1.4.5	Finding the Sample Size Using the =COUNT Function	9
1.4.6	Finding the Mean Score Using the =AVERAGE Function	10
1.4.7	Finding the Standard Deviation Using the =STDEV Function	10
1.4.8	Finding the Standard Error of the Mean	10
1.5	Saving a Spreadsheet	13
1.6	Printing a Spreadsheet	14
1.7	Formatting Numbers in Currency Format (Two Decimal Places)	15
1.8	Formatting Numbers in Number Format (Three Decimal Places)	17
1.9	End-of-Chapter Practice Problems	17
	Reference	20
2	Random Number Generator	21
2.1	Creating Frame Numbers for Generating Random Numbers	21
2.2	Creating Random Numbers in an Excel Worksheet	25

2.3	Sorting Frame Numbers into a Random Sequence	26
2.4	Printing an Excel File so That All the Information Fits onto One Page	30
2.5	End-of-Chapter Practice Problems	33
	Reference	34
3	Confidence Interval About the Mean Using the TINV Function and Hypothesis Testing	35
3.1	Confidence Interval About the Mean	35
3.1.1	How to Estimate the Population Mean	35
3.1.2	Estimating the Lower Limit and the Upper Limit of the 95% Confidence Interval About the Mean	36
3.1.3	Estimating the Confidence Interval the Chevy Impala in Miles Per Gallon	37
3.1.4	Where Did the Number “1.96” Come from?	38
3.1.5	Finding the Value for t in the Confidence Interval Formula	39
3.1.6	Using Excel’s TINV Function to Find the Confidence Interval About the Mean	40
3.1.7	Using Excel to Find the 95% Confidence Interval for a Car’s Miles Per Gallon Claim	40
3.2	Hypothesis Testing	46
3.2.1	Hypotheses Always Refer to the Population of People or Events That You Are Studying	47
3.2.2	The Null Hypothesis and the Research (Alternative) Hypothesis	48
3.2.3	The Seven Steps for Hypothesis Testing Using the Confidence Interval About the Mean	51
3.3	Alternative Ways to Summarize the Result of a Hypothesis Test	57
3.3.1	Different Ways to Accept the Null Hypothesis	57
3.3.2	Different Ways to Reject the Null Hypothesis	58
3.4	End-of-Chapter Practice Problems	58
	References	63
4	One-Group t-Test for the Mean	65
4.1	The 7 STEPS for Hypothesis-Testing Using the One-Group t-Test	65
4.1.1	STEP 1: State the Null Hypothesis and the Research Hypothesis	66
4.1.2	STEP 2: Select the Appropriate Statistical Test	66
4.1.3	STEP 3: Decide on a Decision Rule for the One-Group t-Test	66
4.1.4	STEP 4: Calculate the Formula for the One-Group t-Test	67

4.1.5	STEP 5: Find the Critical Value of t in the t-Table in Appendix E	68
4.1.6	STEP 6: State the Result of Your Statistical Test	69
4.1.7	STEP 7: State the Conclusion of Your Statistical Test in Plain English!	69
4.2	One-Group t-Test for the Mean	70
4.3	Can You Use Either the 95% Confidence Interval About the Mean or the One-Group t-Test When Testing Hypotheses?	75
4.4	End-of-Chapter Practice Problems	75
	References	79
5	Two-Group t-Test of the Difference of the Means for Independent Groups	81
5.1	The 9 STEPS for Hypothesis-Testing Using the Two-Group t-Test	82
5.1.1	STEP 1: Name One Group, Group 1, and the Other Group, Group 2	82
5.1.2	STEP 2: Create a Table That Summarizes the Sample Size, Mean Score, and Standard Deviation of Each Group	82
5.1.3	STEP 3: State the Null Hypothesis and the Research Hypothesis for the Two-Group t-Test	84
5.1.4	STEP 4: Select the Appropriate Statistical Test	84
5.1.5	STEP 5: Decide on a Decision Rule for the Two-Group t-Test	84
5.1.6	STEP 6: Calculate the Formula for the Two-Group t-Test	84
5.1.7	STEP 7: Find the Critical Value of t in the t-Table in Appendix E	85
5.1.8	STEP 8: State the Result of Your Statistical Test	86
5.1.9	STEP 9: State the Conclusion of Your Statistical Test in Plain English!	86
5.2	Formula #1: Both Groups Have More than 30 People in Them	90
5.2.1	An Example of Formula #1 for the Two-Group t-Test	91
5.3	Formula #2: One or Both Groups Have Less than 30 People in Them	97
5.4	End-of-Chapter Practice Problems	103
	References	106

6	Correlation and Simple Linear Regression	107
6.1	What Is a “Correlation?”	107
6.1.1	Understanding the Formula for Computing a Correlation	112
6.1.2	Understanding the Nine Steps for Computing a Correlation, r	112
6.2	Using Excel to Compute a Correlation Between Two Variables	114
6.3	Creating a Chart and Drawing the Regression Line onto the Chart	118
6.3.1	Using Excel to Create a Chart and the Regression Line Through the Data Points	119
6.4	Printing a Spreadsheet so That the Table and Chart Fit onto One Page	126
6.5	Finding the Regression Equation	129
6.5.1	Installing the Data Analysis ToolPak into Excel	129
6.5.2	Using Excel to Find the SUMMARY OUTPUT of Regression	131
6.5.3	Finding the Equation for the Regression Line	135
6.5.4	Using the Regression Line to Predict the y-Value for a Given x-Value	135
6.6	Adding the Regression Equation to the Chart	136
6.7	How to Recognize Negative Correlations in the SUMMARY OUTPUT Table	138
6.8	Printing Only Part of a Spreadsheet Instead of the Entire Spreadsheet	139
6.8.1	Printing Only the Table and the Chart on a Separate Page	139
6.8.2	Printing Only the Chart on a Separate Page	140
6.8.3	Printing Only the SUMMARY OUTPUT of the Regression Analysis on a Separate Page	140
6.9	End-of-Chapter Practice Problems	141
	References	145
7	Multiple Correlation and Multiple Regression	147
7.1	Multiple Regression Equation	147
7.2	Finding the Multiple Correlation and the Multiple Regression Equation	150
7.3	Using the Regression Equation to Predict FROSH GPA	154
7.4	Using Excel to Create a Correlation Matrix in Multiple Regression	154
7.5	End-of-Chapter Practice Problems	157
	References	162

- 8 One-Way Analysis of Variance (ANOVA) 163**
 - 8.1 Using Excel to Perform a One-Way Analysis of Variance (ANOVA) 165
 - 8.2 How to Interpret the ANOVA Table Correctly 167
 - 8.3 Using the Decision Rule for the ANOVA F-Test 167
 - 8.4 Testing the Difference Between Two Groups Using the ANOVA t-Test 168
 - 8.4.1 Comparing LECTURES Versus INDEPENDENT in Their Exam Scores Using the ANOVA t-Test 169
 - 8.5 End-of-Chapter Practice Problems 173
 - References 179
- Appendix A: Answers to End-of-Chapter Practice Problems 181**
- Appendix B: Practice Test 211**
- Appendix C: Answers to Practice Test 223**
- Appendix D: Statistical Formulas 233**
- Appendix E: t-Table 235**
- Index 237**