PRACTICE

Practice the skills you learned in the tutorial using the same case scenario.

Review Assignments

Data File needed for the Review Assignments: Timov.xlsx

Sergei and Ava Timov, friends of Diane and Glenn, ask you to create a similar workbook for their family budget. The Timovs want to purchase a new home. They are considering two houses with different mortgages. They want the budget worksheet you create to display the impact of monthly mortgage payments on the couple's cash flow. They also want to be able to quickly switch between one mortgage plan and another to observe the impact of each plan on their budget. The couple has already designed the workbook and entered estimates of their income and expenses for the upcoming year. You need to set up the formulas. Complete the following:

1. Open the **Timov** workbook located in the Excel3\Review folder included with your Data Files, and then save the workbook as **Timov Family Budget**.
2. In the Documentation sheet, enter your name in cell B3. Use the TODAY function to display the current date in cell B4.
3. In the Family Budget worksheet, in the range C18:N18, use AutoFill to replace the month numbers with the abbreviations **Jan** through **Dec**.
4. In the range C21:N21, calculate the couple's total income. In the range C27:N27, calculate the couple's total monthly expenses. In the range C28:N28, calculate the monthly net cash flow (equal to the total income minus the total expenses).
5. In cell C7, enter a formula to calculate the sum of Sergei's monthly income for the entire year. In cell D7, calculate Sergei's average monthly income. In cell E7, calculate Sergei's maximum monthly income. In cell F7, calculate Sergei's minimum monthly income.
6. Complete the Year-End Summary table by first selecting the range C7:F7. Use AutoFill to copy the formula in the range C7:F7 into the range C7:F16. Use the Auto Fill Options button to copy only the formulas into the selected range and not both the formulas and the formats. (*Hint*: Because you haven't yet entered any mortgage payment values, cell D14 will show the value #DIV/0!, indicating that Excel cannot calculate the average mortgage payment. You'll correct that problem shortly.)
7. In the range K2:K7, enter the following loan and loan conditions of the first mortgage:
   a. In cell K2, enter **6.7%** as the annual interest rate.
   b. In cell K3, enter **12** as the number of payments per year.
   c. In cell K4, calculate the monthly interest rate.
   d. In cell K5, enter **30** as the number of years in the mortgage.
   e. In cell K6, calculate the total number of months to repay the loan.
   f. In cell K7, enter **395,000** as the loan amount.
8. In cell K8, use the PMT function to calculate the monthly payment required to repay this loan.
9. Edit the formula in cell K8, adding a minus sign directly before the PMT function to make the value returned by the formula positive rather than negative.
10. In the range K10:K15, enter the following conditions of the second mortgage plan, and calculate the monthly interest rate and the total number of months to repay the loan:
    - The annual interest rate is **6.7%**.
    - The interest rate is compounded **12** times a year (or monthly).
    - The mortgage will last **20** years.
    - The loan amount (or value of the principal) is **$300,000**.

11. In cell K16, enter the PMT function to calculate the monthly payment needed to pay off this loan, and then edit the formula to make the value displayed in the cell positive by placing a negative sign in front of the PMT function.
12. Sergei and Ava want to be able to view their monthly cash flow under both mortgage plans. The mortgage being applied to the budget will be determined by whether 1 or 2 is entered into cell E3. To switch from one mortgage to another, do the following:
    a. In cell C26, enter an IF function that tests whether cell E3 equals 1. If it does, return the value of cell K8; otherwise, return the value of cell K16. Use absolute cell references for all references in the formula.
    b. Use AutoFill to copy the formula in cell C26 into the range D26:N26.
    c. Verify that the values in the range C26:N26 match the monthly payment for the first mortgage condition. (Note that the worksheet will display the monthly payment amount to the nearest dollar.)
13. In cell E3, change the value from 1 to **2**. Verify that the monthly payment for the second mortgage appears in the range C26:N26.
14. Sergei and Ava want to maintain an average net cash flow of at least $1,000 per month. Is this achieved on either mortgage plan?
15. Save and close the workbook, and then submit the finished workbook to your instructor, either in printed or electronic form, as requested.

APPLY

Case Problem 1

If you have a SAM 2010 user profile, your instructor may have assigned an autogradable version of this assignment. If so, log into the SAM 2010 Web site at www.cengage.com/sam2010 to download the instructions and start files.

Data File needed for this Case Problem: Chemistry.xlsx

Chemistry 303 Karen Raul is a professor of chemistry at a community college in Shawnee, Kansas. She has started using Excel to calculate the final grade for students in her Chemistry 303 course. The final score is a weighted average of the scores given for three exams and the final exam. One way to calculate a weighted average is by multiplying each student's exam score by the weight given to the exam, and then totaling the results. For example, consider the following four exam scores:

Exam 1 = 84 Exam 2 = 80 Exam 3 = 83 Final Exam = 72

If the first three exams are each given a weight of 20 percent and the final exam is given a weight of 40 percent, the weighted average of the four scores is:

84*0.2 + 80*0.2 + 83*0.2 + 72*0.4 = 78.2

Karen has already entered the scores for her students and formatted much of the workbook. You will enter the formulas and highlight the top 10 overall scores in her class. Complete the following:

1. Open the **Chemistry** workbook located in the Excel3\Case1 folder included with your Data Files, and then save the workbook as **Chemistry 303 Final Scores**.
2. In the Documentation sheet, enter your name in cell B3 and the date in cell B4.
3. In the First Semester Scores worksheet, in cell F17, enter a formula to calculate the weighted average of the first student's four exams. Use the weights found in the range C8:C11, matching each weight with the corresponding exam score. Use absolute cell references for the four weights.
4. Use AutoFill to copy the formula in cell F17 into the range F18:F52.
5. In cell B5, use the COUNT function to calculate the total number of students in the class.
6. In cell D8, calculate the median score for the first exam.
7. In cell E8, calculate the maximum score for the first exam.
8. In cell F8, calculate the minimum score for the first exam.

9. In cell G8, calculate the range of scores for the first exam, which is equal to the difference between the maximum and minimum score.
10. Repeat Steps 6 through 9 for each of the other two exams, the final exam, and the overall weighted score.
11. Use conditional formatting to highlight the top 10 scores in the range F17:F52 in a light red fill with dark red text.
12. Insert a page break at cell A14, repeat the first three rows of the worksheet in any printout, and verify that the worksheet is in portrait orientation.
13. Save and close the workbook, and then submit the finished workbook to your instructor, either in printed or electronic form, as requested.

Use formulas and functions to create an order form for a fireworks company.

APPLY

Case Problem 2

Data File needed for this Case Problem: Wizard.xlsx

WizardWorks Andrew Howe owns and operates WizardWorks, an online seller of fireworks based in Franklin, Tennessee. Andrew wants you to help him develop an order form for his business. The form needs to contain formulas to calculate the charge for each order. The total charge is based on the quantity and type of items ordered plus the shipping charge and the 5 percent sales tax. Orders can be shipped using standard 3- to 5-day shipping for $3.99 or overnight for $10.99. Andrew is also offering a 4 percent discount for orders that exceed $200. Both the shipping option and the discount need to be calculated using formulas based on values entered into the worksheet. Complete the following:

1. Open the **Wizard** workbook located in the Excel3\Case2 folder included with your Data Files, and then save the workbook as **WizardWorks Order Form**.
2. In the Documentation sheet, enter your name in cell B3 and enter the date in cell B4.
3. In the Order Form worksheet, in cell C4, enter the customer name, **Kevin Kemper**. In cell C6, enter the order number, **28314**. In the range C9:C13, enter the following address:

   Address 1: **315 Avalon Street**
   City: **Greenfield**
   State: **IN**
   Zip: **46140**
4. In cell C5, enter a function that displays the current date.
5. In the range B20:E22, enter the following orders:

Item	Name	Price	Qty
BF001	**Bucket of Fireworks**	**$45.75**	**1**
NAF	**Nightair Fountain**	**$12.95**	**4**
MR20B	**Mountain Rockets (Box 20)**	**$55.25**	**2**

6. In cell C15, enter **overnight** to ship this order overnight.

EXPLORE

7. In cell F20, enter an IF function that tests whether the order quantity in cell E20 is greater than 0 (zero). If it is, return the value of cell E20 multiplied by cell D20; otherwise, return no text by entering **""**. AutoFill this formula into the range F21:F25.
8. In cell F27, calculate the sum of the values in the range F20:F25.
9. In cell F28, enter an IF function that tests whether cell F27 is greater than 200. If it is, return the value of cell F27 multiplied by the discount percentage in cell F12; otherwise, return the value 0 (zero).
10. In cell F29, subtract the discount value in cell F28 from the subtotal value in cell F27.
11. In cell F31, calculate the sales tax by multiplying the after discount value in cell F29 by the sales tax percentage, 0.05.

EXPLORE

12. In cell F32, determine the shipping charge by entering an IF function that tests whether cell C15 equals "standard". If it does, return the value in cell F9; otherwise, return the value in cell F10.
13. In cell G32, display the value of cell C15.
14. In cell F34, calculate the total of the after discount value, the sales tax, and the shipping fee.
15. Reduce the quantity of Mountain Rockets boxes from 2 to **1**, and then verify that the discount is changed to 0 for the order.
16. Change the shipping option from overnight to **standard**, and then verify that the shipping fee is changed to the fee for standard shipping.
17. Save and close the workbook, and then submit the finished workbook to your instructor, either in printed or electronic form, as requested.

CHALLENGE

Explore how to use relative and absolute references and the PMT function to create a loan table.

Case Problem 3

Data File needed for this Case Problem: Loan.xlsx

Eason Financial Services Jesse Buchmann is a finance officer at Eason Financial Services in Meridian, Idaho. She works with people who are looking for home mortgages. Most clients want mortgages they can afford, and affordability is determined by the size of the monthly payment. The monthly payment is determined by the interest rate, the total number of payments, and the size of the home loan. Jesse can't change the interest rate, but homebuyers can reduce their monthly payments by increasing the number of years to repay the loan. Jesse wants to give her clients a grid that displays combinations of loan amounts and payment periods so that they can select a loan that best meets their needs and budget. Jesse already entered much of the layout and formatting for the worksheet containing the loan payment grid. You will enter the PMT function. Complete the following:

1. Open the **Loan** workbook located in the Excel3\Case3 folder included with your Data Files, and then save the workbook as **Loan Grid**.
2. In the Documentation sheet, enter your name and the date.
3. In the Loan Calculation worksheet, in cell E3, enter a monthly payment of **$1,750**.
4. In cell E5, enter the annual interest rate of **5.75%**. In cell E6, enter **12** to indicate that the interest payment is compounded 12 times a year, or monthly.
5. In the range C10:C20, use AutoFill to enter the currency values **$250,000** through **$350,000** in increments of $10,000. In the range D9:H9, use AutoFill to enter the year values **15** through **35** in increments of 5 years.

EXPLORE

6. In cell D10, use the PMT function to calculate the monthly payment required to repay a **$250,000** loan in **15** years at **5.75%** interest compounded monthly. Use absolute references to cells E5 and E6 to enter the annual interest rate and number of payments per year. Use the mixed references D$9 and $C10 to cells D9 and C10, respectively, to reference the number of years to repay the loan and the loan amount. Place a minus sign before the PMT function so that the value returned by the function is positive rather than negative.

EXPLORE

7. Using AutoFill, copy the formula in cell D10 into the range E10:H10, and then copy that range of formulas into the range D11:H20.

EXPLORE

8. Conditionally format the range D10:H20 to highlight all of the values in the range that are less than the value in cell E3 in a dark green font on a green fill.
9. Add a second conditional format to the range D10:H20 to highlight all of the values in the range that are greater than the value in cell E3 in a dark red font on a red fill.

EXPLORE

10. Change the value in cell E3 from $1,750 to **$1,800**. If this represents the maximum affordable monthly payment, use the values in the grid to determine the largest mortgage for payment schedules lasting 15 through 35 years. Can any of the home loan values displayed in the grid be repaid in 20 years at $1,800 per month?
11. Save and close the workbook, and then submit the finished workbook to your instructor, either in printed or electronic form, as requested.

Create a workbook that automatically grades a driving exam.

CREATE

Case Problem 4

Data File needed for this Case Problem: V6.xlsx

V-6 Driving Academy Sebastian Villanueva owns and operates the V-6 Driving Academy, a driving school located in Pine Hills, Florida. In addition to driving, students must take multiple-choice tests offered by the Florida Department of Motor Vehicles. Students must answer at least 80 percent of the questions correctly to pass each test. Sebastian has to grade these tests himself. Sebastian could save a lot of time if the test questions were in a workbook and Excel totaled the test results. Sebastian has already entered a 20-question test into a workbook. You will format this workbook and insert the necessary functions and formulas to grade a student's answers. Complete the following:

1. Open the **V6** workbook located in the Excel3\Case4 folder included with your Data Files, and then save the workbook as **V6 Driving Test**.
2. In the Documentation sheet, enter your name in cell B3 and enter the date in cell B4.
3. In the Exam1 worksheet, format the questions and possible answers so that the worksheet is easy to read. The format is up to you. At the top of the worksheet, enter a title that describes the exam, and then enter a function that returns the current date.
4. Add a section somewhere on the Exam1 worksheet where Sebastian can enter each student's name and answers to each question. Design the workbook so that Sebastian can always go back and review any student's completed exam.
5. The answers for the 20 questions are listed below. Use this information to write functions that will grade each answer, giving 1 point for a correct answer and 0 otherwise. Assume that all answers are in lowercase letters; therefore, the function that tests the answer to the first question should check for a "c" rather than a "C".

Question	Answer	Question	Answer	Question	Answer
1	c	8	a	15	b
2	a	9	c	16	b
3	b	10	b	17	b
4	a	11	c	18	b
5	c	12	b	19	b
6	b	13	b	20	c
7	c	14	a		

6. At the top of the worksheet, insert a formula to calculate the total number of correct answers for each student.
7. Insert another formula that divides the total number of correct answers by the total number of exam questions on the worksheet. Display this value as a percentage.
8. Enter a logical function that displays the message "PASS" on the exam if the percentage of correct answers is greater than or equal to 80 percent; otherwise, the logical function displays the message "FAIL".
9. Test your worksheet with the following student exams. Which students passed and which failed? What score did each student receive on the exam?

Juan Marquez

Question	Answer	Question	Answer	Question	Answer
1	a	8	a	15	b
2	b	9	c	16	b

3	b	10	b	17	a
4	a	11	c	18	b
5	c	12	b	19	b
6	b	13	a	20	c
7	c	14	a		

Kurt Bessette

Question	Answer	Question	Answer	Question	Answer
1	a	8	a	15	c
2	a	9	b	16	b
3	b	10	c	17	a
4	a	11	c	18	b
5	c	12	a	19	a
6	b	13	b	20	c
7	c	14	a		

Rebecca Pena

Question	Answer	Question	Answer	Question	Answer
1	c	8	a	15	c
2	a	9	c	16	b
3	b	10	a	17	b
4	a	11	c	18	b
5	c	12	b	19	b
6	b	13	b	20	b
7	c	14	a		

10. Format the worksheet so that it prints nicely with no questions crossing over a page break, and the names of the students and the name of the driving academy at the top of each page.
11. Save and close the workbook, and then submit the finished workbook to your instructor, either in printed or electronic form, as requested.

ASSESS

SAM: Skills Assessment Manager

For current SAM information, including versions and content details, visit SAM Central (http://samcentral.course.com). If you have a SAM user profile, you may have access to hands-on instruction, practice, and assessment of the skills covered in this tutorial. Since various versions of SAM are supported throughout the life of this text, check with your instructor for the correct instructions and URL/Web site for accessing assignments.

ENDING DATA FILES

Tutorial
Drake Family Budget.xlsx

Review
Timov Family Budget.xlsx

Case1
Chemistry 303 Final Scores.xlsx

Case2
WizardWorks Order Form.xlsx

Case3
Loan Grid.xlsx

Case4
V6 Driving Test.xlsx