Concepts Review

True/False Questions

Each of the following statements is either true or false. Indicate your choice by circling T or F.

T F 1. Color scales are best described as what-if analysis.

T F 2. A scenario summary report is created on its own sheet.

T F 3. Goal Seek uses parameters to set restrictions on each cell.

T F 4. A trendline highlights the most common data points in a series.

T F 5. You can use named ranges or cell addresses to build a scenario.

T F 6. The purpose of what-if analysis is to use an IF statement in more than one formula.

T F 7. The Research tool can include an encyclopedia, a thesaurus, and translation dictionaries.

T F 8. In Solver, you can have more than one adjustable cell.

Short Answer Questions

Write the correct answer in the space provided.

1. What Solver term describes a limitation or restriction on a cell?

2. What does the Thesaurus component of the Research tool do?

3. How would you create the following label: José?

4. Name two document properties that you can set and edit.

5. What are the three types of data visualizations that are part of conditional formatting options?

6. In a scenario summary report, what do the expand and collapse buttons do?

7. What term might be described as what-if analysis in reverse?

_____

8. What is a trendline?

_____

Critical Thinking

Answer these questions on a separate page. There are no right or wrong answers. Support your answers with examples from your own experience, if possible.

1. What types of problems might arise for a company from using the Research tools in a workbook?

2. Think of what-if analysis problems that you face as an employee or a student. How could you use the tools covered in this lesson, such as trendlines, Goal Seek, and Solver?

Skills Review

Exercise 9-24

Monitor workbook security. Create scenarios. Set conditional formatting. Manage scenarios.

AllAround Vision Care sells a specialty eyeglass frame made from environmentally friendly materials. From each sale, a contribution of $3 is made to Better Planet, an ecological nonprofit organization. In the worksheet, you need to calculate the contribution amounts for the fourth quarter. From the projected data, you will create scenarios with a related summary report. The workbook does have a macro and has been marked as final.

1. Monitor workbook security by following these steps:
    a. Click the **File** command tab and choose **Options**.
    b. Click **Trust Center**. Click **Trust Center Settings**. Click **Macro Settings**.
    c. Click to select **Disable all macros with notification** if it is not selected. Click **OK** to close the Trust Center. Click **OK** again.
    d. Open **Excel_SR9-24**, a macro-enabled workbook. Exit Protected View if necessary.
    e. In the Security Warning bar, click **Enable this content**.
    f. Click **Edit Anyway** to turn off this property.
    g. Click the **View** command tab. Click the Macros button 🖳. Choose **CompanyName** and click **Run**. Make the label bold.
    h. Press F12 and name the workbook *[your initials]*9-24.

i.   Click the **Save as type** arrow and choose **Excel Workbook**.

j.   Click **Save**. Click **Yes**.

2.   Create scenarios by following these steps:

a.   Select cells B3:E4. Click the **Formulas** command tab. Click the Create from Selection button 🖼. Use the top row for range names. Click **OK**.

b.   Name cell B5 as **OctDollars**. Name cell C5 as **NovDollars** and cell D5 as **DecDollars**. Name cell E5 as **TotalDollars**.

> **NOTE**
>
> This worksheet includes a named constant for the price.

c.   Click the Name Manager button 🖳 and choose **New**. Key **Contribution** as the name. In the **Refers to** box, key **=3** to create a constant. Close the dialog box.

d.   Click cell B6 and key **=**. Click cell B4 and key ***cont**. Press Tab and then press Enter. Copy this formula to cell E6. All the formulas use the named range **Oct**.

> **NOTE**
>
> Range names are absolute references in a formula.

e.   Click cell B6 and key **=b4*cont**. Press Tab and then press Enter. Copy this formula to cell E6. Cell references are relative.

f.   Format the results as accounting.

g.   Select cells B4:D4. Click the **Data** command tab. Click the What-If Analysis button 📊. Choose **Scenario Manager**. Click **Add**.

> **TIP**
>
> While the default comment is selected, key the new one to replace it.

h.   In the **Scenario name** box, key **Modest Sales.** Press Tab.

i.   In the **Changing cells** box, note that the selected cells are listed. Press Tab.

j.   In the **Comment** box, key **Assumes modest sales**. Click **OK**.

k.   Do not change any values. Click **OK**.

> **REVIEW**
>
> Press Tab to move from one entry box to the next in the Scenario Values dialog box.

l.   Click **Add**. Key **Best Sales** as the name. Press Tab. Keep the same **Changing cells** box.

m.   Press Tab. For the **Comment**, key **Assumes high sales.** Click **OK**.

n.   Key the following values for each of the changing cells:

   Oct   **180**
   Nov   **200**
   Dec   **190**

o.   Click **OK**. Click **Add**.

p.   Add a scenario named **Worst Sales** with the **Comment Assumes low sales.** and the values shown here.

   Oct   **90**
   Nov   **100**
   Dec   **95**

q.   Click **OK**. Click **Close**.

3. Set conditional formatting by following these steps:

    a. Select cells B4:D4 and click the **Home** command tab.

    b. Click the Conditional Formatting button and choose **Color Scales**.

    c. Choose the two-color scale **Green-Yellow**.

    d. Select cells B5:D5 and click the Conditional Formatting button. Choose **Highlight Cells Rules** and **More Rules**.

    e. Choose **Cell Value**.

    f. Choose **greater than or equal to**.

    g. Click in the rightmost text box and key **12000**.

    h. Click **Format**. On the **Font** tab, choose **Bold Italic**. For **Color** choose **Green** from the **Standard Colors**.

    i. Close the dialog boxes.

4. Manage scenarios by following these steps:

    a. Click the **Data** command tab. Click the What-If Analysis button.

    b. Choose **Scenario Manager**.

    c. Choose **Worst Sales** in the list and click **Edit**.

    d. Change the value for October to **75**. Click **Show**.

    e. In the Scenario Manager dialog box, click **Summary**. Choose **Scenario summary**.

    f. In the **Result cells** box, select the range B5:E5. Click **OK**.

5. Select cells B7:D7 on the **4thQtr** worksheet. Click the **Home** command tab and click the arrow with the Merge and Center button. Choose the option to merge the cells. Wrap the text and set it for middle and center alignment. Adjust the row height as needed. Center the page horizontally.

6. Prepare and submit your work.

Exercise 9-25

Set conditional formatting. Manage scenarios. Forecast with a trendline.

Gas-permeable contact lenses have been sold for many years by eye professionals, and AllAround Vision Care keeps sales data. The workbook includes scenarios, but some of the data have been adjusted, and you need to make those edits. Instead of a color scale, you have decided to use icon sets for your conditional formatting. In a related chart, the company would like to project 6 months' sales for the higher than expected sales scenario.

1. Open **Excel_SR9-25** and remove the Marked as Final property. Save the workbook as *[your initials]*9-25.

2. Set conditional formatting by following these steps:

    a. Select cells B4:D4 and click the **Home** command tab.

    b. Click the Conditional Formatting button and choose **Icon Sets**.

    c. Choose **3 Arrows (Colored)**.

3. Manage scenarios by following these steps:

   a. Click the **Data** command tab.

   b. Click the What-If Analysis button. Choose **Scenario Manager**.

   c. Edit the **High Sales** scenario to show these changing cells:

Oct	**75**
Nov	**85**
Dec	**95**

   d. Show the **High Sales** scenario.

   e. From the **Scenario Manager** dialog box, create a **Scenario summary** report using cells B5:E5 as the **Result cells**.

   f. Expand row 3 to display the scenario comments.

4. Select cells B3:D4 on the **4thQtr** sheet and create a column chart sheet. Add a chart title above the chart that displays **Projected Sales of Gas Permeable Lenses**. Choose chart **Style 27**.

5. Forecast with a trendline by following these steps:

   a. Click the **Chart Tools Layout** tab.

   b. Click the Trendline button. Choose **More Trendline Options**.

   c. Choose **Logarithmic** in the **Trend/Regression Type** group.

   d. In the **Trendline Name** group, choose **Custom**. Key **Next 6 Months** in the **Custom** box.

   e. In the **Forecast Forward** box, key **6**.

   f. Click **Line Style**.

   NOTE

   A logarithmic line is a curved line and is suited to values that increase or decrease quickly and then level out.

   g. Use a 3-point width. Choose **Long Dash** for the **Type**. For the **End type** in the **Arrow settings** group, choose **Open Arrow**. Click **Close**.

   h. On the **Chart Tools Design** tab, click the Select Data button. Name the first series as **Pairs Sold**.

6. Prepare and submit your work.

Exercise 9-26

Use Goal Seek. Use Solver. Manage scenarios.

In this workbook, your first task is to use Goal Seek with two financial functions already calculated by the human resources personnel. One formula determines a monthly car payment for a loan, and you would like to know how much can be borrowed if you can afford a $350 monthly payment. This same worksheet has another formula that calculates how much money you'll have in an account if you save a particular amount each month. On another worksheet, AllAround Vision Care has tallied the number of gallons of water saved by the new faucets and drinking fountains. You've been asked to use Solver to calculate how the company could increase its savings to a specified dollar amount.

1. Open **Excel_SR9-26** and save it as *[your initials]9-26*.

2. Use Goal Seek by following these steps:

   a. On the **CreditUnion** worksheet, click cell B9. The PMT function is from the financial category and calculates a monthly payment using the number of payments, the amount, and the interest rate. The red color and the parentheses indicate a negative number, money that must be spent.

   b. Click the **Data** command tab. Click the What-If Analysis button 📊.

   c. Choose **Goal Seek**. In the **To value** box, key **350**. This is the desired car payment.

   d. Click cell B6 for the **By changing cell** box. This is the loan amount: how much could be borrowed if the payment is $350.

   e. Click **OK**. Goal Seek changes the loan amount to a negative value; the payment amount is no longer negative. Click **OK** to keep the solution.

<table>
<tr><td>**NOTE**

Goal Seek sets the borrowed amount to a negative number, because the PMT function assumes the lender's (the credit union's) perspective.</td></tr>
</table>

   f. Click cell F9. The FV function is from the financial category. It uses a savings amount, a time period, an interest rate, and possible beginning balances to determine how much an account would be worth at the end of that time period.

   g. Click the What-If Analysis button 📊. Choose **Goal Seek**.

   h. In the **To value** box, key **7000**, the desired account value in 4 years.

   i. Use cell F8 for the **By changing cell** box. This is the interest rate and is not going to result in a logical solution.

   j. Click **OK**. Excel tries but cannot find a reasonable solution.

   k. Click **Cancel**.

<table>
<tr><td>**REVIEW**

If you accidentally kept the wrong solution, undo the action.</td></tr>
</table>

   l. Click the What-If Analysis button 📊. Choose **Goal Seek**. Set up the same problem by changing the monthly deposit.

   m. Click **OK** to keep the solution.

3. Click the **WaterConserve** worksheet tab. Review the data and the formulas in columns D and F. Calculate totals for cells B8:D8 and cell F8.

4. Use Solver by following these steps:

   a. Click cell F8. This is the objective cell; the company wants to know how it could increase its savings to $250.

   b. Click the **Data** command tab. Click the Solver button 📊.

   c. Choose **Value of** and key **250** as the targeted savings.

   d. In the **By Changing Variable Cells** box, select cells E4:E7. Savings will increase, of course, when new costs take effect.

   e. Click **Solve**. When water costs reach these levels, the company will show an increased dollar savings amount. But this is not the best way to attain this goal.

   f. Click **Save Scenario**. Key **New Costs** in the **Scenario Name** box. Click **OK**.

g. Choose **Restore Original Values**. Click **OK**.

h. Click the Solver button 📲. The objective cell and the value setting are the same.

i. In the **By Changing Variable Cells** box, select cells C4:C7. Some adjustments can be made to the equipment to increase the number of gallons saved per hour.

j. Click **Add** in the **Subject to the Constraints** group.

k. In the **Cell Reference** box, click cell C4. Click the arrow for the middle (operator) box and choose **<=**. In the **Constraint** box, key **6**. The equipment is limited in how it can be adjusted.

l. Click **Add**. In the **Cell Reference** box, select cell C5. Choose **<=** as the operator. In the **Constraint** box, key **10**. Click **Add**.

m. In the **Cell Reference** box, select cell C6. Choose **<=** as the operator and set **7.5** as the **Constraint**. Click **OK**.

n. Click **Solve**.

o. Click **Save Scenario**. Key **Increased per Hour** and click **OK**.

p. Choose **Restore Original Values**. Click **OK**.

5. Manage scenarios by following these steps:

a. Click the **Data** command tab.

b. Click the What-If Analysis button 📊. Choose **Scenario Manager**.

c. Create a **Scenario summary** report using cell F8 as the **Result cells** setting.

6. Click the **File** command tab. Choose **Protect Workbook** and then **Mark as Final**. Click **OK** in both message boxes. Close Backstage view.

7. Prepare and submit your work.

Exercise 9-27

Monitor workbook security. Use the Research tool. Work with the Info pane.

As preparation for increased sales from Latin America and Mexico, AllAround Vision Care wants to promote several eyeglass frames on its Web site using Spanish names. You are to use the Translation tool to find substitute Spanish names.

1. Open **Excel_SR9-27** and remove the Marked as Final property. Save the workbook as *[your initials]*9-27.

2. Use the Research tool by following these steps:

a. Click cell A5. Click the **Review** command tab. Click the Translate button 📖.

b. Click the Expand icon ▷ for **Translation** in the Research task pane.

c. In the **To** box, choose **Spanish (International Sort)**. Click the Expand icon ▷ for **Bilingual dictionary** if the list is not expanded.

d. Click cell B5 and key **Luna Azul**.

e. Click cell A6. Click the Translate button 📑. The translation for "cat" is "gato."

f. In the **Search For** box, delete **Cat** leaving **Eyes**. Click the Start Searching button ➡️.

g. Click cell B6 and key **Ojos de Gato**.

h. Click cell A7. Click the Translate button 📑.

i. Review the results. In cell B7 key **Luz del D**. Do not complete the entry.

j. In **Edit** mode for cell B7, click the **Insert** command tab. In the **Symbols** group, click the Symbol button Ω.

k. Set the **Font** to **Calibri** and the **Subset** to **Basic Latin**.

l. Find **í**, the accented lowercase "i." This is an acute accent. Click the character and click **Insert**. Click **Close**.

m. Key **a** to complete the entry as "Luz del Día."

n. Find Spanish words for the remaining two frame names.

o. Insert a row at row 3. In cell A3 key **Discovery en Espa**. The next character is an accented lowercase n (ñ).

p. In **Edit** mode for cell A3, click the **Insert** tab. Click the Symbol button Ω.

q. Set the **Font** to **Calibri** and the **Subset** to **Basic Latin**.

r. Find **ñ**, the accented lowercase "n." This is a *tilde* accent. Click the character and click **Insert**. Click **Close**.

s. Complete the label in cell A3 to show "Discovery en Español."

3. Work with the Info pane by following these steps:

a. Press Ctrl + Home. Click the **File** tab.

b. Click the arrow with **Properties** and choose **Advanced Properties**.

c. Click the **Summary** tab. In the **Author** box, key *[your first and last name]*.

d. In the **Title** box, key **Spanish Frame Names**.

e. Key **AllAround Vision Care** as the company name.

f. Click to select **Save Thumbnails for All Excel Documents**.

g. Close the dialog box and then close Backstage view.

4. Prepare and submit your work.

Lesson Applications

Exercise 9-28

Set conditional formatting.

In an expanded worksheet about water usage, you need to complete the labels, format the data as an Excel table, and then apply a color scale. You'll then insert column sparklines to help illustrate the day-to-day usage. In a copy of the sheet, you are going to build an eight-level color sort to arrange the values for Monday.

1. Open **Excel_LA9-28** and save it as *[your initials]*9-28. Rename **Sheet1** as **WaterUse**.

2. Fill in the labels that are missing in column A. Center the page horizontally.

3. Create a table with a header row using **Table Style Light 1**. Turn off the banded rows. Select the cells, and build a horizontal and vertical border layout.

4. Change the font size to 12 for the table. Edit the header row label for column A to **Week**. Format the values as comma style with no decimals.

5. Create a **Green-Yellow-Red** color scale for the values.

6. Point at the **Sat** column label to display a black arrow and select the column. Create a highlight cells rule for values greater than or equal to 10,000 to be formatted as bold italic.

7. Select cells H4:H19, and insert column sparklines for the entire value range. Format them to match the color scale. Set a minimum vertical axis value of 0. Make all the data rows 40 pixels tall. Add borders to the sparkline range so that it matches the table.

8. Recenter the labels in rows 1:2 across the appropriate selection.

> **NOTE**
>
> It is difficult to sort by color if the colors have been applied using a color scale.

9. Make a copy of the worksheet. On the copied sheet, hide columns C:H. Then make columns A:B wide enough to display the labels in rows 1:2.

10. Sort from largest to smallest and note how the colors are rearranged.

11. Prepare and submit your work.

Exercise 9-29

Create and manage scenarios. Use Goal Seek.

The company has determined kilowatt-hours used for last year and now wants to predict how usage can be controlled over the next year. It has identified a general growth percentage of 1.5%. This means its usage is

expected to increase by at least that percentage. To balance that, each office applies a savings factor that reduces that growth factor. The directions for completing the formulas are on the sheet. When the projections are completed, you'll use Goal Seek to see how or if the company could reach a targeted kilowatt-hours saving level with a probable growth rate.

1. Open **Excel_LA9-29** and save it as *[your initials]9-29*.

2. In cell D15, calculate first-quarter kilowatt-hours for next year using the forecast formula explained on the worksheet. This formula uses absolute and mixed references. Copy the formula without formatting to complete this section of the sheet.

3. In cell H15, use SUM with a range that does not include values from last year. Copy the formula. Show a total in cell H19.

4. Add a scenario named **1.5% Growth** with the changing cell as cell H4. Include your name in the comment.

5. Use Goal Seek to find a growth rate that will result in 5,000,000 in total kilowatt-hours (cell H19). Save the Goal Seek solution as a scenario named **New Growth**, and include your name in the comment.

6. Create a scenario summary report for cells D15:G18.

7. Prepare a formula copy of the **EnergyForecast** worksheet, hiding columns A:C.

8. Prepare and submit your work.

Exercise 9-30

Set conditional formatting. Use Goal Seek. Create and manage scenarios. Forecast with a trendline. Work with the Info pane.

AllAround Vision Care employees participate in a Bike, Don't Drive incentive. They track miles ridden to work with each office's improvement point level. The value used for improvement points is based on past participation and achievement. The total points are banked in a national program to encourage fewer automobile emissions. You'll be creating range names, adding formatting, and building scenarios for the Boston office. It wants to know how much it has to raise its point level to reach a particular level and would like to see it in a chart. After the work is done for Boston, each office will be able to assess its own level and goal.

1. Open **Excel_LA9-30** and save it as *[your initials]9-30*.

2. Create range names for the improvement points data. Review the defined names that have already been created.

3. From the **Review** command tab, run **Spelling** and make corrections as needed.

4. Create a highlight cells rule to show improvement points greater than 3,000 in bold green italic.

5. Create a scenario named **Boston1** for cell D20.

6. Use Goal Seek to find an improvement point level for Boston that would result in 45,000 in total points (cell F17). This means that Boston is being asked to increase its points but the other cities are not. Save the Goal Seek solution as a scenario named **Boston2**.

7. Create a scenario summary report for cells B13:E13. In the report, edit the labels in column C to show the quarter names.

8. Show the **Boston2** scenario, and create a line chart for cells B12:E13 on a separate sheet. Add a title and format the line chart. Add and format a trendline that projects points for four quarters.

9. Edit the document properties to show your name as the author and **AllAround Vision Care** as the company. Include a thumbnail.

10. Prepare and submit your work.

Exercise 9-31 ◆ Challenge Yourself

Use Solver. Create and manage scenarios. Work with the Info pane.

The Dallas office of AllAround Vision Care wants to optimize its advertising dollars. It will use Solver to determine the lowest media cost that will result in the most exposures (number of times an ad is heard or seen). The worksheet lists three media with estimated audience numbers and costs. You will complete the worksheet and formulas and use Solver to calculate the best combination of media.

> **↔ REVIEW**
>
> Select the cell range and click the Name Box. Key the range name and press `Enter`. Press `F3` to see a list of defined names in the workbook.

> **📝 NOTE**
>
> Although the amount of money to allocate is not yet determined, you can use that cell in a formula.

1. Open **Excel_LA9-31** and save it as *[your initials]*9-31.

2. Name cell F12 as **TotalExposure**. Name cells C10:E10 as **TotalCost**. Name cells C11:E11 as **SampleRun**. Finally, name cells C8:E8 as **EstimatedRun**.

3. In row 11, build a formula to calculate how many ads can be run based on the money allocated to the media.

4. In row 12, build a formula to determine the number of exposures if the sample number of ads is run at the indicated cost per ad.

5. In cell F10, build a formula that sums all amounts allocated. In cell F12, build a formula that sums total exposures.

6. Add a scenario named **Original** for the worksheet as it exists. Set the range named "TotalCost" for the changing cells.

7. Use Solver to find the minimum amount for cell F10 by changing the "TotalCost" range. The constraints are as follows:

C11	>=	8
D11	>=	10
E11	>=	5
TotalCost	>=	0
TotalExposure	>=	5000000

8. Save the Solver solution as a scenario named **Scenario 1** and display it.

9. Create a scenario summary report with cell F10 as a result cell. In rows below the main report, key an explanation for each constraint used in the Solver problem.

10. Insert a new sheet and paste a list of range names. Supply labels and your own formatting. Name this sheet **Documentation**.

11. Edit document properties to show your name as the author and **AllAround Vision Care** as the company. Include a thumbnail.

12. Prepare and submit your work.

On Your Own

In these exercises you work on your own, as you would in a real-life work environment. Use the skills you've learned to accomplish the task—and be creative.

Exercise 9-32

In a new workbook, key labels, values, and formulas for a sports activity with which you are familiar. Use players or team names, scores, or other statistics that you know or can locate. Make your own format choices. Save your first set of scores or statistics as a scenario. Create best-case and worst-case scenarios for your players and teams. Create a scenario summary report. Save the workbook as *[your initials]*9-32. Prepare and submit your work.

Exercise 9-33

Create a workbook that lists dates starting at today and continuing for 30 days from now in one column. In the second column, show the day of the week (Monday, Tuesday). In the third column, enter values to represent the number of phone calls, e-mails, or text messages that you received, either at home or the office. In the fourth column, enter values to represent the number of calls or messages that you sent. Apply a color scale. Then experiment using highlight cells rules that you create. Add labels and other formatting effects to prepare a professional worksheet. Save the workbook as *[your initials]*9-33. Prepare and submit your work.

Exercise 9-34

In a new workbook, key the names and costs of five items or activities that you would like to buy or do (new TV, trip to Paris, donating to a charity, etc.). Sum the cost of purchasing or doing one of each item or activity. Use Solver to find three target totals that are lower than the actual total by changing the price or cost of one or more of the items. If Solver cannot find a solution or finds an unacceptable one, try adding constraints. Solve for reasonable amount, and save each possibility as a scenario. After you have completed your analysis, make a copy of the sheet and translate each item name into a language for which the dictionary is available on your computer. Save the workbook as *[your initials]*9-34. Prepare and submit your work.