Lesson 4: Using Basic Formulas

## Step-by-Step 1 – Display Formulas

**GET READY. Before you begin these steps, LAUNCH Microsoft Excel and OPEN a new blank workbook.**

**1.** Click cell **A1**.

**2.** Type **=7+8\*3/2-4** and press **Enter**. You just entered a formula.

*Formulas should be typed without spaces, but if you type spaces, Excel eliminates them when you press Enter.*

**3.** Click cell **A1**. Notice that the result of the formula displays in the cell, but the formula itself appears in the formula bar.



**4.** Double-click cell **A1**. The formula appears in both the active cell and the formula bar. You can edit the formula in this mode.

**5.** Press **Enter**.

**6.** On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas**. The formula in cell A1 displays.



*While you are displaying formulas, you will not see the results of those formulas.*

**7.** Click **Show Formulas** again to turn off formula display.

**8.** SAVE the workbook in your Lesson 4 folder as ***04 Formula Practice Solution***.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 2 – Understand the Order of Operations

**GET READY. USE the worksheet from the previous exercise.**

**1.** Click cell **A1** to make it the active cell.

**2.** Click in the formula bar.

**3.** Insert parentheses around **7 + 8**.

**4.** Insert parentheses around **3 / 2**.

**5.** Insert parentheses around **(7 + 8) \* (3 / 2)**, as shown in the formula bar. Press **Enter**. The result in A1 changes to *18.5.*

**6.** SAVE the workbook in your Lesson 4 folder as ***04 Order of Operations Solution*** and CLOSE it.

**PAUSE. LEAVE Excel open to use in the next exercise.**

## Step-by-Step 3 – Create a Formula that Performs Addition

**GET READY. LAUNCH Microsoft Excel if it is not already open.**

**1.** OPEN the ***04 Budget Start*** data file for this lesson.

**2.** In cell A18, type **January Rent plus Deposit** and press **Enter**.

**3.** In cell B18, type the equal (**=**) sign, type **1200+500**, and press **Enter**. This is the simplest way to enter an addition formula. Excel adds the values in the formula and displays the result, *1700*, which is your first month’s rent plus a $500 deposit. Your worksheet now looks like that shown.



**4.** SAVE the workbook in your Lesson 4 folder as ***04 Budget Basic Formulas Solution.***

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 4 – Create a Formula that Performs Subtraction

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Double-click cell **A18**.

**2.** Click after the word “Deposit,” type **, minus Discount**, and press **Enter**.

**3.** Right-click cell **A18**, select **Format Cells**, click the **Alignment** tab, select the **Wrap text** check box, and click **OK**. Now you can see all of the new text added to A18.

**4.** Click cell **B18** to make it the active cell.

**5.** Click in the formula bar.

**6.** Position the cursor immediately after **=1200+500**, type **-100**, and press **Enter**. Your landlord gave you a $100 discount for moving into your rental home early, so you are subtracting $100 from your first month’s rent. The value in cell B18 changes to *1600* to reflect the new formula.

**7.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

*When you modified the formula to subtract 100 from 1700, you could have entered* ***=1200+500−100*** *or* ***= −100+1200+500****. Either formula yields a positive 1600.*

## Step-by-Step 5 – Create a Formula that Performs Multiplication

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** In cell A19, type **Annual Rent per Lease** and press **Enter**.

**2.** In cell B19, type **=1200\*12** and press **Enter**. The result displays in cell B19, which is the total amount of rent you will pay in one year.

**3.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 6 – Create a Formula that Performs Division

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** In cell A20, type **Average Electricity** and press **Enter**.

**2.** In cell B20, type **=N8/12** and press **Enter**. The result displays in cell B20, which is the average monthly amount you will pay for electricity in one year.

**3.** SAVE the workbook and CLOSE it.

**PAUSE. LEAVE Excel open to use in the next exercise.**

## Step-by-Step 7 – Use Relative Cell References in a Formula

**GET READY. OPEN the *04 Budget Cell References* data file for this lesson.**

**1.** Click cell **B18**.

**2.** Click in the formula bar and replace 1200 with cell **B3**. Notice that cell B3 is highlighted and surrounded by a blue border while you’re modifying the formula.

*You can use either uppercase or lowercase when you type a cell reference in a formula. For example, it does not matter whether you type B4 or b4 in the formula you enter.*

**3.** Press **Enter**. The formula in cell B18 now uses a relative cell reference to cell B3.

**4.** Copy cell **B18** to cell **B21**. The displayed result changes to *400*.

**5.** Notice in the formula bar that the formula in cell B21 is =B6+500-100, but the formula you copied is =B3+500-100. That’s because the original cell reference of cell B3 changed to cell B6 when you copied the formula down three cells, and cell B6 is blank. The cell reference is adjusted relative to its position in the worksheet.

**6.** An alternate way to use a cell reference is to click the cell being referenced while creating or modifying a formula. With cell B21 still active, click in the formula bar and select **B6**.

**7.** Click cell **B3**. Cell B3 becomes highlighted and surrounded by a blue dashed border, and cell B3 appears in the formula bar rather than cell B6 (see Figure 4-10). Press **Enter**.

**8.** SAVE the workbook in your Lesson 4 folder as ***04 Budget Cell References Solution***.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 8 – Use an Absolute Cell Reference in a Formula

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Click cell **B18**.

**2.** Click in the formula bar and insert dollar signs in the B3 cell reference so it looks like **$B$3**.

**3.** Press **Enter**. The formula in cell B18 now uses an absolute cell reference to cell B3.

**4.** Copy cell **B18** to cell **B21**. The displayed result is *1600*, which matches B18.

**5.** Copy cell **B21** to cell **C21**. The displayed result is still *1600*.

**6.** Notice in the formula bar that the formulas in cells B21 and C21 are both =$B$3+500-100. Figure 4-11 shows the formula for cell C21. Regardless of where you copy the formula in the worksheet, the formula still refers to cell B3.

**7.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 9 – Use a Mixed Cell Reference in a Formula

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Click cell **B21**.

**2.** Click in the formula bar and delete the dollar sign before **3** in the formula so it looks like **$B3**.

**3.** Press **Enter**. The formula in cell B21 now uses a mixed cell reference.

**4.** Copy cell **B21** to cell **C22**. The displayed result is *440*, which is different from the result in B21. That’s because the formula in C22 references cell B4 (see Figure 4-12). The dollar sign before the B in the formula is absolute, but the row number is relative.

**5.** Delete the contents of cell **B21**, cell **C21**, and cell **C22**.

**6.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 10 – Refer to Data in Another Worksheet

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Click the **Summary** sheet tab in the ***04 Budget Cell References Solution*** workbook.

**2.** Click cell **D8**. You want the average payment for electricity to appear in this cell, similar to the content that appears in B20 in the Expense Details worksheet. However, your formula must reference the Expense Details worksheet to gather the data.

**3.** Type **=SUM(‘Expense Details’!N8)/12** and press **Enter**. This formula divides the value of cell N8 in the Expense Details worksheet by 12. The result is *176*, rounded due to cell formatting applied to the worksheet (see the figure).



**4.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 11 – Reference Data in Another Workbook

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Open a second workbook, the data file named ***04Budget2012***.

**2.** In ***04 Budget Cell References Solution***, on the Summary sheet, click cell **C3**.

**3.** Type **=([04Budget2012.xlsx]Summary!B3)**, as shown in Figure 4-14, and press **Enter**. The formula links to cell B3 on the Summary sheet in the workbook named ***04Budget2012***.



**4.** SAVE the workbook and CLOSE it.

**5.** CLOSE ***04Budget2012***.

**PAUSE. LEAVE Excel open to use in the next exercise.**

## Step-by-Step 12 – Name a Range of Cells

**Get Ready. OPEN the *04 Budget Ranges* data file for this lesson.**

**1.** Click **Enable Content**, if prompted. Click the **Expense Details** sheet tab.

**2.** Select **B3:B14**. These are the cells to be named.

**3.** To the left of the formula bar, click the **Name** box.

**4.** Type a one-word name for the list, such as **Q1Expenses**, and press **Enter**. The range name appears in the Name box (see Figure 4-17). Excel saves this name and uses it in any subsequent reference to this range. (Don’t worry about the apparent misnaming of the range. You modify this range to include additional months in an exercise later in this lesson.)

*When naming a range, if a message appears stating that the name already exists, display the Name Manager (discussed in the “Changing the Size of a Range” section) and edit the existing name or delete it and enter a different name.*

**5.** An alternative way to name a range is to use the New Name dialog box. Select **B16:M16**.

**6.** On the FORMULAS tab, in the Defined Names group, click **Define Name**. The New Name dialog box appears.

**7.** Excel uses the row heading as the range name, shown in the Name text box. You can change the name if you like. For this exercise, leave the default name.

**8.** Open the **Scope drop-down list**. Your options are Workbook, Expense Details, and Summary. The last two entries correspond to individual sheets in the workbook. Close the drop-down list, leaving **Workbook** selected.

**9.** Enter comments in the Comments text box, if you like.

**10.** Leave the cell address that appears in the Refers to text box. This is the range you selected. Notice that the sheet name is also included automatically.

**11.** Click **OK**. The name *Utilities\_Subtotals* is saved for the range B16:M16.

**12.** A third way to name a range is to use the Create Names from Selection dialog box. Select **N2:N14**. This selection includes the column heading label.

**13.** On the FORMULAS tab, in the Defined Names group, click **Create from Selection**. The Create Names from Selection dialog box appears.

**14.** Excel determines that you want to use the column heading label as the range name. Click **OK**. The range is saved with the name *Total*.

**15.** Open the Name box drop-down list. You have three named ranges from which to select.

**16.** SAVE the workbook in your Lesson 4 folder as ***04 Budget Ranges Solution***.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 13 – Change the Size of a Range

**Get Ready. USE the worksheet you modified in the previous exercise.**

**1.** Click the **Expense Details** sheet, if it’s not already active.

**2.** On the FORMULAS tab, in the Defined Names group, click **Name Manager**.

**3.** Select **Q1Expenses**.

**4.** At the bottom of the dialog box, highlight everything in the Refers to box.

**5.** In the Expenses Details worksheet, select **B3:D14**. The content in the Refers to box in the Name Manager dialog box reflects the new range.

**6.** Click **Close**, and then click **Yes** when asked if you want to save your changes.

**7.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 14 – Create a Formula that Operates on a Named Range

**Get ready. Use the worksheet you modified in the previous exercise.**

**1.** In the Expense Details sheet, click **A21**.

**2.** Type **First Quarter Expenses** and press **Enter**.

**3.** In cell B21, type **=SUM(**.

**4.** On the FORMULAS tab, in the Defined Names group, click **Use in Formula**.

**5.** Select **Q1Expenses** from the list (see Figure 4-23), type **)** to close the equation, and press **Enter**. The total amount of expenses for January through March appears in cell B21.

**6.** SAVE the workbook.

**PAUSE. LEAVE the workbook open to use in the next exercise.**

## Step-by-Step 15 – Keep Track of Named Ranges

**GET READY. USE the worksheet you modified in the previous exercise.**

**1.** Open the **Name box drop-down list**. The names of all named ranges available in that workbook display.

**2.** To verify your change to the size of the Q1Expenses range in a previous exercise, select **Q1Expenses**. The range B3:D14 appears highlighted.

**3.** On the FORMULAS tab, in the Defined Names group, click **Name Manager**. Each named range is listed in the dialog box. You can use Name Manager to create a new range, rename a range, delete a range, and verify the scope of a range, among other tasks.

**4.** Click **Close** to close the Name Manager.

**5.** To display range names and their cell ranges as data in the worksheet, select a cell with blank cells to the right and below it, such as cell **P2**.

**6.** On the FORMULAS tab, in the Defined Names group, click **Use in Formula** and then select **Paste Names**. The Paste Name dialog box opens.

**7.** Click **Paste List**. Widen the width of column **P** to display all range names fully. Range names display in column P and their cell ranges display in column Q.

**8.** SAVE the workbook and CLOSE it.

CLOSE Excel.