

Complex Formulas - Order of Operations

Excel calculates formulas based on the following **order of operations**:

1. Operations enclosed in **parentheses**
2. **Exponential** calculations (to the power of)
3. **Multiplication** and **division**, whichever comes first
4. **Addition** and **subtraction**, whichever comes first

A mnemonic that can help you remember the order is **Please Excuse My Dear Aunt Sally**

Create a Complex Formula Using the Order of Operations:

In this example, we will use **cell references** in addition to actual values, to create a complex formula that will add tax to the nursery order.

1. Click the cell where you want the formula result to appear (for example, F11).
2. Type the **equal sign (=)**.
3. Type an **open parenthesis**, then click on the cell that contains the first **value** you want in the formula (for example, F4).
4. Type the first **mathematical operator** (for example, the addition sign).
5. Click on the cell that contains the second **value** you want in the formula (for example, F5), and then type a **closed parenthesis**.
6. Type the next **mathematical operator** (for example, the multiplication sign).
7. Type the next **value** in the formula (for example, 0.055 for 5.5% tax).

Relative References

Relative references can save you time when you are repeating the same kind of calculation across multiple rows or columns. In the following example, we are creating a formula with cell references in row 4 to calculate the total cost of the electric bill and water bill for each month ($B4=B2+B3$). For the upcoming months we want to use the same formula with relative references ($C2+C3$, $D2+D3$, $E2+E3$, etc.) For convenience, we can copy the formula in B4 into the rest of row 4 and Excel will calculate the value of the bills for those months using relative references.

To Create and Copy a Formula Using Relative References

1. Select the first cell where you want to enter the formula (for example, B4).
2. Enter the formula to calculate the value you want (for example, add $B2+B3$).
3. Press **Enter**. The formula will be calculated.
4. Select the cell you want to copy (for example, B4) and click on the **Copy** command from the **Home** tab.
5. Select the cells where you want to paste the formula and click on the **Paste** command from the **Home** tab. (You may also drag the fill handle to fill cells.)
6. Your formula is copied to the selected cells as a relative reference ($C4=C2+C3$, $D4=D2+D3$, $E4=E2+E3$, etc.) and the values are calculated

Absolute References

There may be times when you do not want a cell reference to change when copying or filling cells. You can use an **absolute reference** to keep a row and/or column constant in the formula.

An absolute reference is designated in the formula by the addition of a **dollar sign (\$)**. It can precede the column reference, the row reference, or both.

Create and Copy a Formula Using an Absolute Reference

1. Select the first cell where you want to enter the formula (for example, C4)
2. Click on the cell that contains the first **value** you want in the formula (for example, B4).
3. Type the first **mathematical operator** (for example, the multiplication sign).
4. Type the **dollar sign (\$)** and enter the **column letter** of the cell you are making an absolute reference to (for example, B).
5. Type the **dollar sign (\$)** and enter the **row number** of the same cell you are making an absolute reference to (for example, 1).
6. Press **Enter** to calculate the formula
7. Select the cell you want to copy (for example, C4) and click on the **Copy** command from the **Home** tab.
8. Select the cells where you want to paste the formula and click on the **Paste** command from the **Home** tab. (You may also drag the fill handle to fill cells.)
9. The formula is copied to the selected cells using the absolute reference ($C5=B5*\$B\1 , $C6=B6*\$B\1 , etc.) and the values are calculated.