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**Entering Formulas**

**Precedence**
When a formula contains several operators there is a predetermined order in which the operations are performed:

1. Expressions contained within parentheses
2. Exponential notation
3. Multiplication and Division
4. Addition and Subtraction

- Operators with the same precedence order are evaluated as they occur from left to right.
- To enforce a different ordering enclose the desired elements in parentheses.
- Expressions inside parentheses are evaluated following the precedence order, but before expressions that are outside.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>=10+6/2</td>
<td>13</td>
</tr>
<tr>
<td>=(10+6)/2</td>
<td>8</td>
</tr>
<tr>
<td>=1-3*2</td>
<td>-5</td>
</tr>
<tr>
<td>=(1-3)*2</td>
<td>-4</td>
</tr>
<tr>
<td>=4-3*2</td>
<td>-2</td>
</tr>
<tr>
<td>=(4-3)*2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Text and Logical Operations**
Excel will perform text and logical operations. The & operator concatenates two values to produce one text value. Comparison operators, including =, >, >=, <=, and <> compare two values and return the logical value TRUE or FALSE.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>=123&amp;456</td>
<td>123456</td>
</tr>
<tr>
<td>=6=5</td>
<td>FALSE</td>
</tr>
<tr>
<td>=6&gt;5</td>
<td>TRUE</td>
</tr>
</tbody>
</table>

**More on Formulas**

**Cell References**
Cell references can be used instead of absolute values in formulas. Using cell references enables you to change the value in a cell referenced by a formula; the calculated result updates automatically when the value is updated. To enter a cell reference in a formula, type it in directly or point and click on the cell. Excel will fill in the cell reference.

(Exercise 1)
In the example above, the formula in cell D2 multiplies the value in cell B2 by the value in C2. Any changes to the values are reflected in the sum displayed in D2. For example, if you change the unit price for Black (cell B6) to $50.00 the total will automatically change to $1,250.00 (see below).

Cell references can be edited within formulas if columns are added to the spreadsheet. For example, a column can be added to the above spreadsheet to reflect (in this case, add) the charge for an add-on to each item. The amount in the new column must be included in the original formula to reflect the new total. In this example, the value in the ‘new’ C6 must be added to B6 before the total is multiplied using D6 (note the use of parentheses in the new formula, found in E6, below).
More on AutoSum

As indicated in the previous handout, AutoSum enables you to automatically create a formula. Note that the cell in which the AutoSum formula created in the following graphic is not directly adjacent to the cells included in the formula. **AutoSum formulas can be created in any cell in the workbook (i.e., not only in the active sheet, but any sheet contained in the workbook).** (Exercise 2)

![AutoSum example](image)

Multiple Sheet Calculations

Excel enables you to link two or more sheets to obtain or change results when changes are made to the relevant cells. The results generated in one sheet can be affected by input made to a cell in a different sheet. Rather than performing manual changes in several cell located in different sheets, Excel enables you to create formulas that “link” sheets and relevant cells.

Such a function is illustrated using the spreadsheet created for the above examples (Exercises 1 and 2). For example, the user may want to incorporate the regional sales...
subtotals in the original sheet (Totals) by simply adding new columns. Since the regional sales figures are stored on another sheet (Region Totals) it would be much easier to create a formula that will automatically update the Totals sheet when the regional sales figures are updated.

The user would like to link the two sheets (Totals and Region Totals) to perform the following functions:

- Update the Quantity column (C, above) automatically when the item totals (total foreign and domestic) are changed in the RegionCount sheet.
- Display (and update) region sales totals (E and F, above) when the item totals are changed in RegionCount.
- Update the Total column (D, above). *This is already accomplished when the Quantity cell is updated, since the original formula created for the Total column continues to be accurate.*

The following steps must be performed to create formulas that calculate results using more than one sheet.

1. Activate the ‘home’ cell (the cell in which the formula will be created) and begin the formula by typing =.
2. Select the other sheet by clicking on that sheet’s tab.
3. Click on the cell that will be incorporated from that sheet (‘target’ cell).
4. Press the Enter key.

The resultant formula text in the home cell formula bar will resemble the following; the name of the target cell sheet is displayed in single quotes (‘sheet name’) followed immediately by an exclamation point (!) ending with the target cell:

```
=’RegionCount’!B13
```

Similar syntax is used when creating formulas that link two or more cells from different sheets.
• Activate the home cell and begin the formula by typing =.
• Select the required cell from the current sheet.
• Type the appropriate operand in the formula bar (e.g., *, for multiply).
• Select the other (target) sheet.
• Click on the cell that will be incorporated from that sheet.
• Press the Enter key.

The syntax of the resultant formula text in the home cell formula bar will resemble that shown above. In the case, the cell from the current sheet will be displayed, followed by the syntax used to incorporate the cell from the second sheet:

=B2*'RegionCount'!B7

(Exercise 3)
Printing

Printing output correctly in Excel requires that you specify the area you want to print. In other words, you might have a spreadsheet that contains data in several rows and columns, but you want to only print a small portion of the data. Unless you specify to Excel the exact area you want to print Excel will print the entire sheet. This may result in several pages of unwanted print output.

To select the correct area to print you must perform the following:

1. Highlight (click and drag) the cells to print.

2. Select **Set Print Area** from the **Print Area** selection in the **Page Layout** tab (Page Layout→Page Setup→Print Area→Set Print Area). The selected area will be identified by a dashed line around it.

3. Print the selected area by choosing **Print** from the **Office Button** menu.

You may find that the output does not print as you desire. In other words, you may want the output displayed in a landscape orientation rather than portrait. Or, the output does not fit on one page. Select **Page Setup** from the **File** menu to make the necessary changes to the output format.
The print orientation can be changed (portrait or landscape). Also, the output can be scaled so the entire selection can be printed on one page.