

Lab Session: 07

Objective(s) :

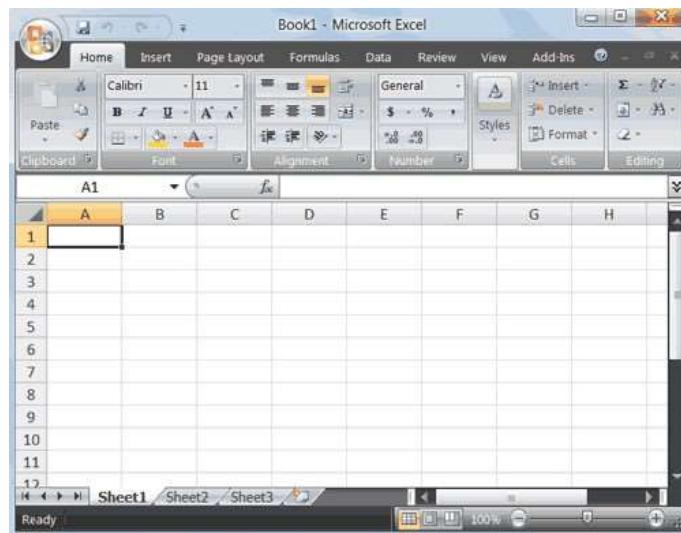
To learn the basics of Microsoft Excel

The Microsoft Excel Window

Microsoft Excel is an electronic spreadsheet. You can use it to organize your data into rows and columns. You can also use it to perform mathematical calculations quickly. This tutorial teaches Microsoft Excel basics.

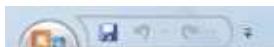
Although knowledge of how to navigate in a Windows environment is helpful, this tutorial was created for the computer novice.

- . The Microsoft Excel window appears and your screen looks similar to the one shown here.



Note: Your screen will probably not look exactly like the screen shown. In Excel 2007, how a window displays depends on the size of your window, the size of your monitor, and the resolution to which your monitor is set. Resolution determines how much information your computer monitor can display. If you use a low resolution, less information fits on your screen, but the size of your text and images are larger. If you use a high resolution, more information fits on your screen, but the size of the text and images are smaller. Also, settings in Excel 2007, Windows Vista, and Windows XP allow you to change the color and style of your windows.

The Quick Access Toolbar



Next to the Microsoft Office button is the Quick Access toolbar. The Quick Access toolbar gives you with access to commands you frequently use. By default, Save, Undo, and Redo appear on the Quick Access toolbar. You can use Save to save your file, Undo to roll back an action you have taken, and Redo to reapply an action you have rolled back.

The Title Bar



Next to the Quick Access toolbar is the Title bar. On the Title bar, Microsoft Excel displays the name of the workbook you are currently using. At the top of the Excel window, you should see "Microsoft Excel - Book1" or a similar name.

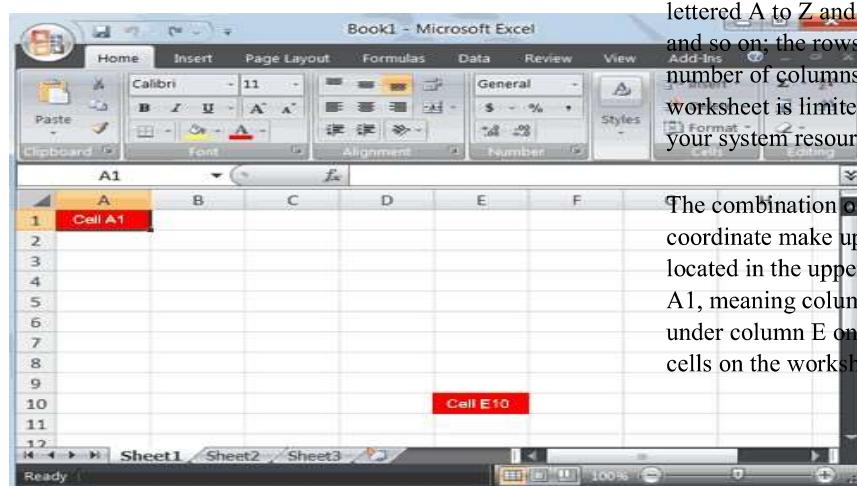
The Ribbon



You use commands to tell Microsoft Excel what to do. In Microsoft Excel, you use the Ribbon to

issue commands. The Ribbon is located near the top of the Excel window, below the Quick Access toolbar. At the top of the Ribbon are several tabs; clicking a tab displays several related command groups. Within each group are related command buttons. You click buttons to issue commands or to access menus and dialog boxes. You may also find a dialog box launcher in the bottom-right corner of a group. When you click the dialog box launcher, a dialog box makes additional commands available.

Worksheets



Microsoft Excel consists of worksheets. Each worksheet contains columns and rows. The columns are lettered A to Z and then continuing with AA, AB, AC and so on; the rows are numbered 1 to 1,048,576. The number of columns and rows you can have in a worksheet is limited by your computer memory and your system resources.

The combination of a column coordinate and a row coordinate make up a cell address. For example, the cell located in the upper-left corner of the worksheet is cell A1, meaning column A, row 1. Cell E10 is located under column E on row 10. You enter your data into the cells on the worksheet.

The Formula Bar



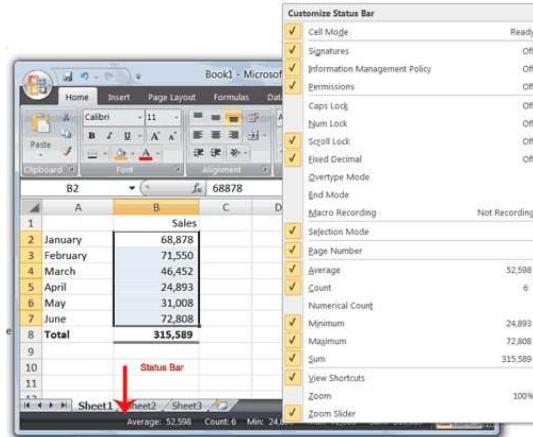
If the Formula bar is turned on, the cell address of the cell you are in displays in the Name box which is located on the left side of the Formula bar. Cell

entries display on the right side of the Formula bar. If you do not see the Formula bar in your window, perform the following steps:

1. Choose the View tab.
2. Click Formula Bar in the Show/Hide group. The Formula bar appears.

Note: The current cell address displays on the left side of the Formula bar.

The Status Bar



Move Around a Worksheet

By using the arrow keys, you can move around your worksheet. You can use the down arrow key to move downward one cell at a time. You can use the up arrow key to move upward one cell at a time. You can use the Tab key to move across the page to the right, one cell at a time. You can hold down the Shift key and then press the Tab key to move to the left, one cell at a time. You can use the right and left arrow keys to move right or left one cell at a time. The Page Up and Page Down keys move up and down one page at a time. If you hold down the Ctrl key and then press the Home key, you move to the beginning of the worksheet.

Move Around the Worksheet

The Down Arrow Key

- Press the down arrow key several times. Note that the cursor moves downward one cell at a time.

The Up Arrow Key

- Press the up arrow key several times. Note that the cursor moves upward one cell at a time.

The Tab Key

1. Move to cell A1.
2. Press the Tab key several times. Note that the cursor moves to the right one cell at a time.

The Shift+Tab Keys

- Hold down the Shift key and then press Tab. Note that the cursor moves to the left one cell at a time.

The Status bar appears at the very bottom of the Excel window and provides such information as the sum, average, minimum, and maximum value of selected numbers. You can change what displays on the Status bar by right-clicking on the Status bar and selecting the options you want from the Customize Status Bar menu. You click a menu item to select it. You click it again to deselect it. A check mark next to an item means the item is selected.

The Right and Left Arrow Keys

1. Press the right arrow key several times. Note that the cursor moves to the right.
2. Press the left arrow key several times. Note that the cursor moves to the left.

Page Up and Page Down

1. Press the Page Down key. Note that the cursor moves down one page.
2. Press the Page Up key. Note that the cursor moves up one page.

The Ctrl-Home Key

1. Move the cursor to column J.
2. Stay in column J and move the cursor to row 20.
3. Hold down the Ctrl key while you press the Home key. Excel moves to cell A1.

Go To Cells Quickly

The following are shortcuts for moving quickly from one cell in a worksheet to a cell in a different part of the worksheet.

Go to -- F5

The F5 function key is the "Go To" key. If you press the F5 key, you are prompted for the cell to which you wish to go. Enter the cell address, and the cursor jumps to that cell.

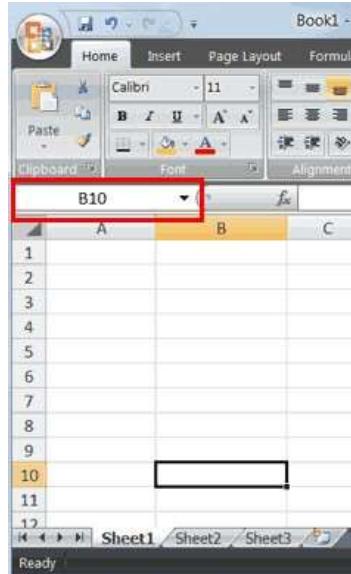
1. Press F5. The Go To dialog box opens.
2. Type **J3** in the Reference field.
3. Press Enter. Excel moves to cell J3.

The Name Box

You can also use the Name box to go to a specific cell.

Name box and then press Enter.

Just type the cell you want to go to in the



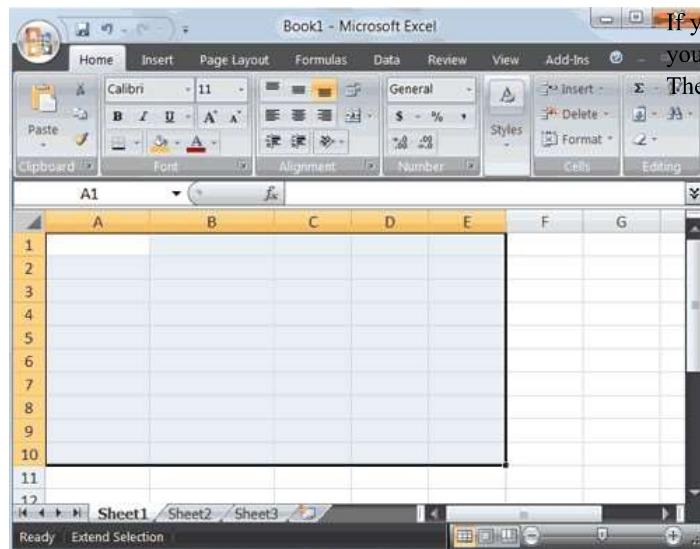
Go to -- Ctrl+G

You can also use Ctrl+G to go to a specific cell.

1. Hold down the Ctrl key while you press "g" (Ctrl+g). The Go To dialog box opens.
2. Type **C4** in the Reference field.
3. Press Enter. Excel moves to cell C4.

1. Type **B10** in the Name box.
2. Press Enter. Excel moves to cell B10.

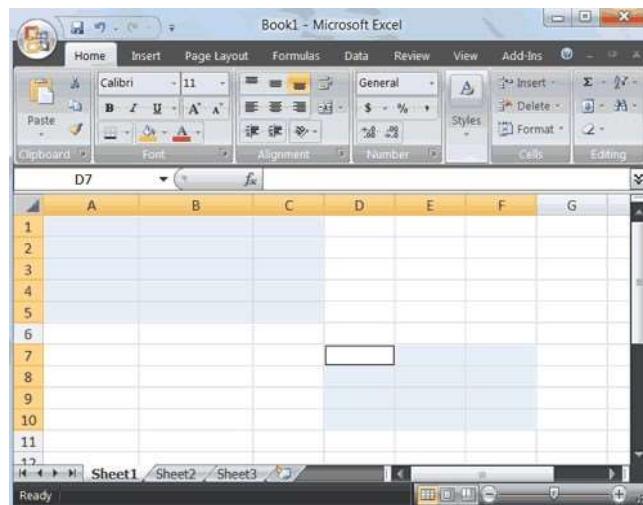
Select Cells



If you wish to perform a function on a group of cells, you must first select those cells by highlighting them. The exercises that follow teach you how to select.

Alternative Method: Select Cells by Dragging

You can also select an area by holding down the left mouse button and dragging the mouse over the area. In addition, you can select noncontiguous areas of the worksheet by doing the following:

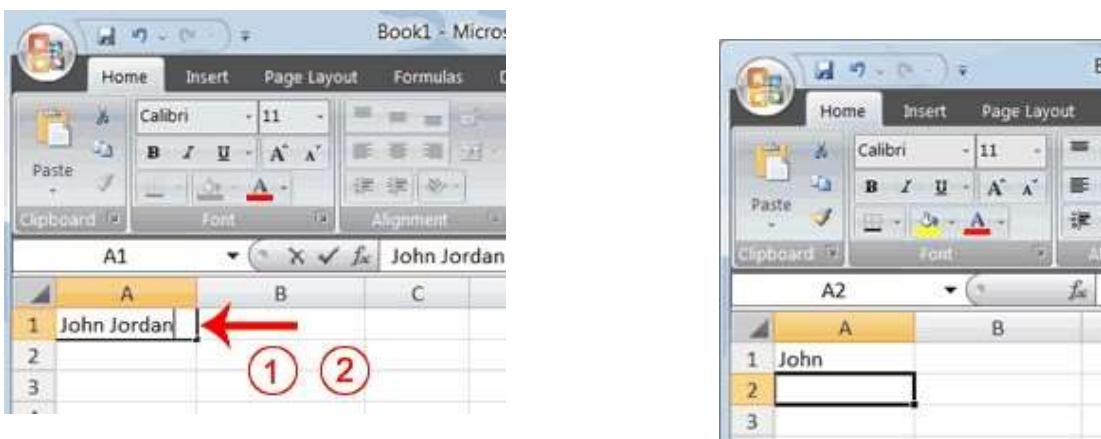


1. Go to cell A1.
2. Hold down the Ctrl key. You won't release it until step 9. Holding down the Ctrl key enables you to select noncontiguous areas of the worksheet.
3. Press the left mouse button.
4. While holding down the left mouse button, use the mouse to move from cell A1 to C5.
5. Continue to hold down the Ctrl key, but release the left mouse button.
6. Using the mouse, place the cursor in cell D7.
7. Press the left mouse button.
8. While holding down the left mouse button, move to cell F10. Release the left mouse button.
9. Release the Ctrl key. Cells A1 to C5 and cells D7 to F10 are selected.
10. Press Esc and click anywhere on the worksheet to remove the highlighting.

Enter Data

In this section, you will learn how to enter data into your worksheet. First, place the cursor in the cell in which you want to start entering data. Type some data, and then press Enter. If you need to delete, press the Backspace key to delete one character at a time.

Enter Data



Delete Data

The Backspace key erases one character at a time.

1. Press the Backspace key until Jordan is erased.
2. Press Enter. The name "John" appears in cell A1.

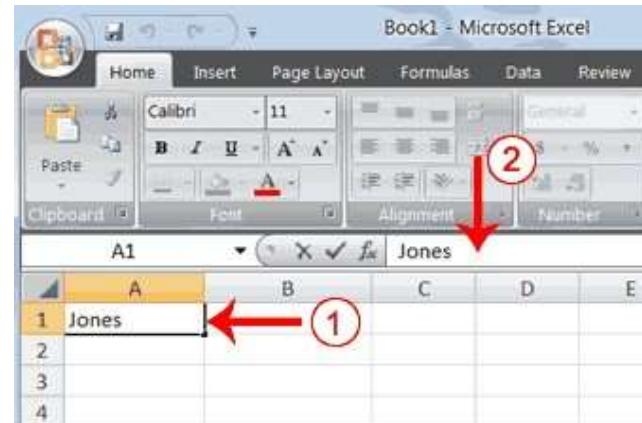
Edit a Cell

After you enter data into a cell, you can edit the data by pressing F2 while you are in the cell you wish to edit.

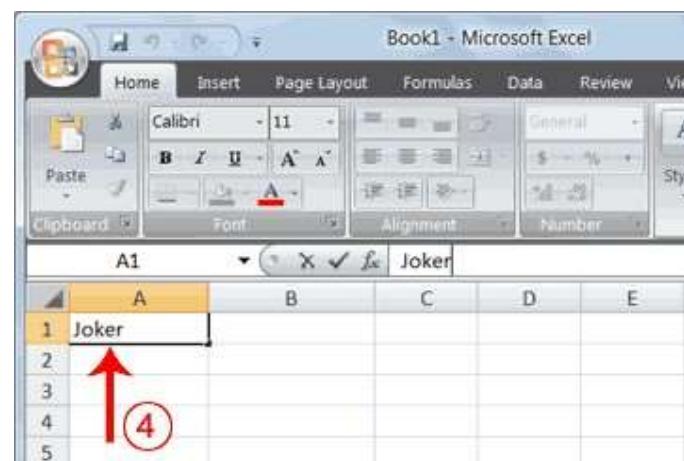
	<p>Edit a Cell</p> <p>Change "John" to "Jones."</p> <ol style="list-style-type: none"> 1. Move to cell A1. 2. Press F2. 3. Use the Backspace key to delete the "n" and the "h." 4. Type nes. <p>5. Press Enter.</p>
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Alternate Method: Editing a Cell by Using the Formula Bar

You can also edit the cell by using the Formula bar. You change "Jones" to "Joker" in the following exercise.



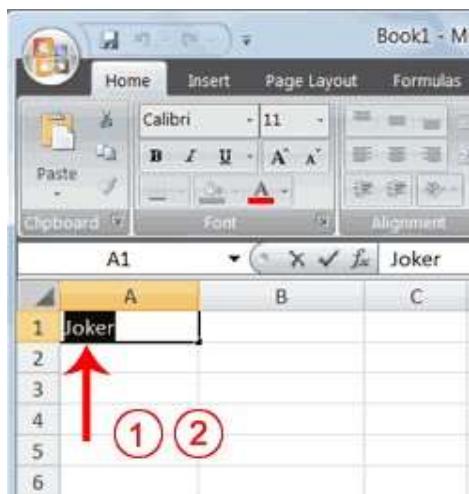
1. Move the cursor to cell A1.
2. Click in the formula area of the Formula bar.



3. Use the backspace key to erase the "s," "e," and "n."
4. Type **ker**.
5. Press Enter.

Alternate Method: Edit a Cell by Double-Clicking in the Cell

You can change "Joker" to "Johnson" as follows:



1. Move to cell A1.
2. Double-click in cell A1.
3. Press the End key. Your cursor is now at the end of your text.

Book1 - M		
Home Insert Page Layout Formulas		
Paste	Font	Clipboard
A2		f _x
A	B	C
1 Johnson		
2		
3		
4		
5		
6		

3. Use the Backspace key to erase "r," "e," and "k."
4. Type **hnson**.
5. Press Enter.

Change a Cell Entry

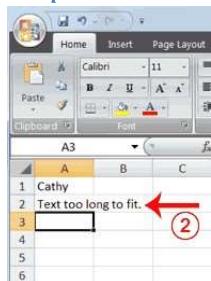
Typing in a cell replaces the old cell entry with the new information you type.

1. Move the cursor to cell A1.
2. Type **Cathy**.
3. Press Enter. The name "Cathy" replaces "Johnson."

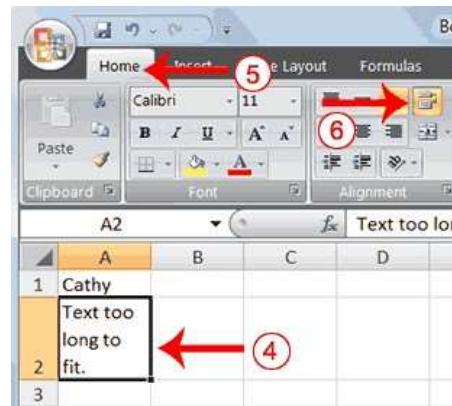
Book1 - M		
Home Insert Page Layout Formulas		
Paste	Font	Clipboard
A2		f _x
A	B	C
1 Cathy		
2		
3		
4		
5		
6		

Wrap Text

When you type text that is too long to fit in the cell, the text overlaps the next cell. If you do not want it to overlap the next cell, you can wrap the text.

Wrap Text

1. Move to cell A2.
2. Type **Text too long to fit.**
3. Press Enter.



4. Return to cell A2.
5. Choose the Home tab.
6. Click the Wrap Text button . Excel wraps the text in the cell.

Delete a Cell Entry

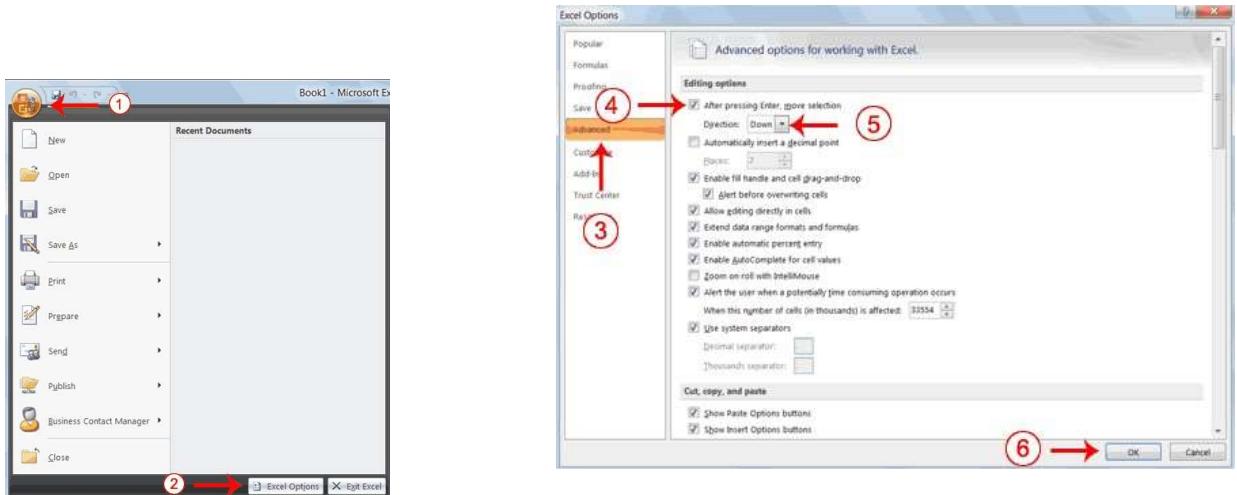
To delete an entry in a cell or a group of cells, you place the cursor in the cell or select the group of cells and press Delete.

Entering Excel Formulas and Formatting Data

Lesson 1 familiarized you with the Excel window, taught you how to move around the window, and how to enter data. A major strength of Excel is that you can perform mathematical calculations and format your data. In this lesson, you learn how to perform basic mathematical calculations and how to format text and numerical data. To start this lesson, open Excel.

Set the Enter Key Direction

In Microsoft Excel, you can specify the direction the cursor moves when you press the Enter key. In the exercises that follow, the cursor must move down one cell when you press Enter. You can use the Direction box in the Excel Options pane to set the cursor to move up, down, left, right, or not at all. Perform the steps that follow to set the cursor to move down when you press the Enter key.



1. Click the Microsoft Office button. A menu appears.
2. Click Excel Options in the lower-right corner. The Excel Options pane appears.

3. Click Advanced.
4. If the check box next to After Pressing Enter Move Selection is not checked, click the box to check it.
5. If Down does not appear in the Direction box, click the down arrow next to the Direction box and then click Down.
6. Click OK. Excel sets the Enter direction to down.

Lab Session: 08

Objective:

Working with Formulas in Microsoft Excel

Perform Mathematical Calculations

In Microsoft Excel, you can enter numbers and mathematical formulas into cells. Whether you enter a number or a formula, you can reference the cell when you perform mathematical calculations such as addition, subtraction, multiplication, or division. When entering a mathematical formula, precede the formula with an equal sign. Use the following to indicate the type of calculation you wish to perform:

+ Addition

/ Division

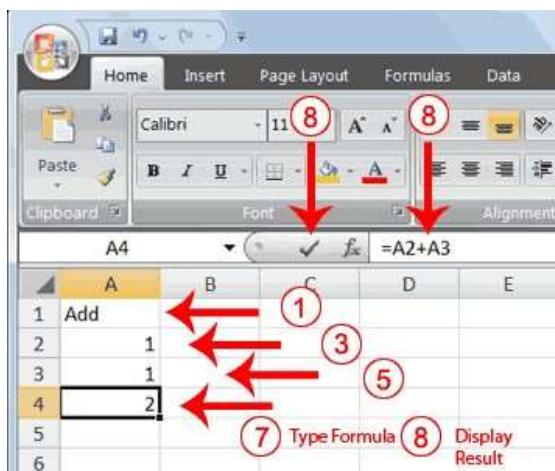
- Subtraction

[^] Exponential

* Multiplication

In the following exercises, you practice some of the methods you can use to move around a worksheet and you learn how to perform mathematical calculations.

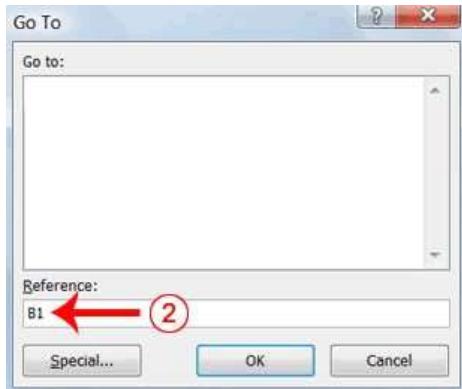
Addition



1. Type **Add** in cell A1.
2. Press Enter. Excel moves down one cell.
3. Type **1** in cell A2.
4. Press Enter. Excel moves down one cell.
5. Type **1** in cell A3.
6. Press Enter. Excel moves down one cell.
7. Type **=A2+A3** in cell A4.
8. Click the check mark on the Formula bar. Excel adds cell A1 to cell A2 and displays the result in cell A4. The formula displays on the Formula bar.

Note: Clicking the check mark on the Formula bar is similar to pressing Enter. Excel records your entry but does not move to the next cell.

Subtraction



1. Press F5. The Go To dialog box appears.
2. Type **B1** in the Reference field.
3. Press Enter. Excel moves to cell B1.

4. Type **Subtract**.
5. Press Enter. Excel moves down one cell.
6. Type **6** in cell B2.
7. Press Enter. Excel moves down one cell.
8. Type **3** in cell B3.
9. Press Enter. Excel moves down one cell.
10. Type **=B2-B3** in cell B4.
11. Click the check mark on the Formula bar. Excel subtracts cell B3 from cell B2 and the result displays in cell B4. The formula displays on the Formula bar.

Multiplication

1. Hold down the Ctrl key while you press "g" (Ctrl+g). The Go To dialog box appears.
2. Type **C1** in the Reference field.
3. Press Enter. Excel moves to cell C1
4. Type **Multiply**.
5. Press Enter. Excel moves down one cell.
6. Type **2** in cell C2.

7. Press Enter. Excel moves down one cell.
8. Type **3** in cell C3.
9. Press Enter. Excel moves down one cell.
10. Type **=C2*C3** in cell C4.
11. Click the check mark on the Formula bar. Excel multiplies C1 by cell C2 and displays the result in cell C3. The formula displays on the Formula bar.

Division

1. Press F5.
2. Type **D1** in the Reference field.
3. Press Enter. Excel moves to cell D1.
4. Type **Divide**.
5. Press Enter. Excel moves down one cell.
6. Type **6** in cell D2.
7. Press Enter. Excel moves down one cell.

8. Type **3** in cell D3.
9. Press Enter. Excel moves down one cell.
10. Type **=D2/D3** in cell D4.
11. Click the check mark on the Formula bar. Excel divides cell D2 by cell D3 and displays the result in cell D4. The formula displays on the Formula bar.

When creating formulas, you can reference cells and include numbers. All of the following formulas are valid:

- | | |
|--------------|--------------|
| 1. =A2/B2 | 3. =A2*B2+12 |
| 2. =A1+12-B3 | 4. =24+53 |

AutoSum

You can use the AutoSum button  on the Home tab to automatically add a column or row of numbers.

When you press the AutoSum button , Excel selects the numbers it thinks you want to add. If you then click the check mark on the Formula bar or press the Enter key, Excel adds the numbers. If Excel's guess as to which numbers you want to add is wrong, you can select the cells you want.

AutoSum

The following illustrates AutoSum:

Book1 - Microsoft Excel

Home **8** Formulas Data Review View Add-Ins

RANDBETWEEN Formulas

Add Subtract Multiply Divide

9

1 **2** **4** **6** **9**

=SUM(F1:F3)

1	Add	Subtract	Multiply	Divide	F1	3	G
2	1	6	2	3	F2	3	
3	1	3	3	3	F3	3	
4	2	3	6	2	F4	9	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

Sheet1 Sheet2 Sheet3

Type 3.

Press Enter. Excel moves down one cell.

Type 3.

Press Enter. Excel moves down one cell to cell F4.

Choose the Home tab.

Click the AutoSum button Σ in the Editing group. Excel selects cells F1 through F3 and enters a formula in cell F4.

E	F	G
	3	
	3	
	3	
	9	

1. Go to cell F1.

2. Type 3.

3. Press Enter. Excel moves down one cell.

10. Press Enter. Excel adds cells F1 through F3 and displays the result in cell F4.

Perform Automatic Calculations

By default, Microsoft Excel recalculates the worksheet as you change cell entries. This makes it easy for you to correct mistakes and analyze a variety of scenarios.

Automatic Calculation

Make the changes described below and note how Microsoft Excel automatically recalculates.

Home Insert Page Layout Formulas Data

Clipboard **2** **5** **8** **11**

Font Alignment

A4

A B C D E

1	Add	Subtract	Multiply	Divide	=A2+A3
2	2	8	4	12	
3	1	3	3	3	
4	3	5	12	4	
5					
6					
7					

1. Move to cell A2.
2. Type **2**.
3. Press the right arrow key. Excel changes the result in cell A4. Excel adds cell A2 to cell A3 and the new result appears in cell A4.
4. Move to cell B2.
5. Type **8**.
6. Press the right arrow key. Excel subtracts cell B3 from cell B3 and the new result appears in cell B4.

Align Cell Entries

When you type text into a cell, by default your entry aligns with the left side of the cell. When you type numbers into a cell, by default your entry aligns with the right side of the cell. You can change the cell alignment. You can center, left-align, or right-align any cell entry. Look at cells

7. Move to cell C2.
8. Type **4**.
9. Press the right arrow key. Excel multiplies cell C2 by cell C3 and the new result appears in cell C4.
10. Move to cell D2.
11. Type **12**.
12. Press the Enter key. Excel divides cell D2 by cell D3 and the new result appears in cell D4.

A1 to D1. Note that they are aligned with the left side of the cell.

	A	B	C	D
1	Add	Subtract	Multiply	Divide
2	2	8	4	12

Center

To center cells A1 to D1:

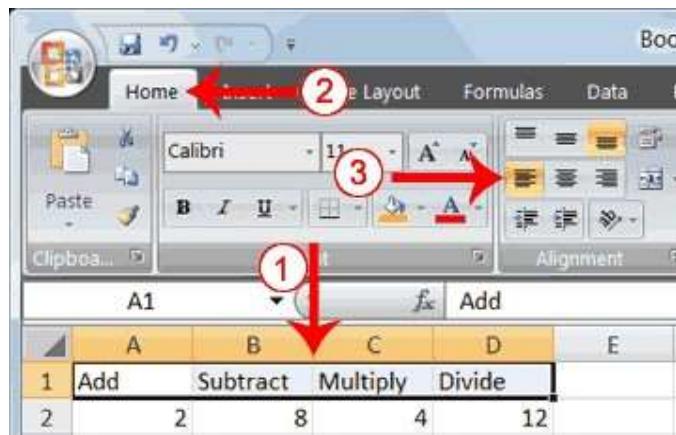
The screenshot shows the Microsoft Excel ribbon with the 'Home' tab selected. In the 'Font' section of the ribbon, the font is set to 'Calibri' and the size is '11'. The 'Alignment' group is open, showing various alignment options. Step 1 is a red arrow pointing to cell A1. Step 2 is a red arrow pointing to the 'Home' tab. Step 3 is a red arrow pointing to the 'Center' button in the 'Alignment' group. Below the ribbon, a table is visible with data in cells A1 through D1.

	A	B	C	D
1	Add	Subtract	Multiply	Divide
2	2	8	4	12

1. Select cells A1 to D1.
2. Choose the Home tab.
3. Click the Center button in the Alignment group. Excel centers each cell's content.

Left-Align

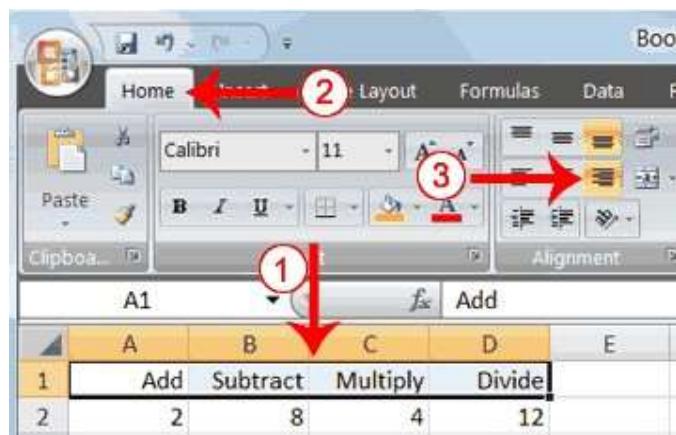
To left-align cells A1 to D1:



1. Select cells A1 to D1.
2. Choose the Home tab.
3. Click the Align Text Left  button in the Alignment group. Excel left-aligns each cell's content.

Right-Align

To right-align cells A1 to D1:



1. Select cells A1 to D1. Click in cell A1.
2. Choose the Home tab.
3. Click the Align Text Right  button. Excel right-aligns the cell's content.
4. Click anywhere on your worksheet to clear the highlighting.

Note: You can also change the alignment of cells with numbers in them by using the alignment buttons.

Perform Advanced Mathematical Calculations

When you perform mathematical calculations in Excel, be careful of precedence. Calculations are performed from left to right, with multiplication and division performed before addition and subtraction.

Advanced Calculations

1. Move to cell A7.
2. Type $=3+3+12/2*4$.
3. Press Enter.

Note: Microsoft Excel divides 12 by 2, multiplies the answer by 4, adds 3, and then adds another 3. The answer, 30, displays in cell A7.

A7		f _x	=3+3+12/2*4
7	30		
8			

To change the order of calculation, use parentheses. Microsoft Excel calculates the information in parentheses first.

1. Double-click in cell A7.
2. Edit the cell to read =(3+3+12)/2*4.

3. Press Enter.

Note: Microsoft Excel adds 3 plus 3 plus 12, divides the answer by 2, and then multiplies the result by 4. The answer, 36, displays in cell A7.

A7		f _x	=3+3+12/2*4
7	36		
8			

Copy, Cut, Paste, and Cell Addressing

In Excel, you can copy data from one area of a worksheet and place the data you copied anywhere in the same or another worksheet. In other words, after you type information into a worksheet, if you want to place the same information somewhere else, you do not have to retype the information. You simple copy it and then paste it in the new location.

You can use Excel's Cut feature to remove information from a worksheet. Then you can use the Paste feature to place the information you cut anywhere in the same or another worksheet. In other words, you can move information from one place in a worksheet to another place in the same or different worksheet by using the Cut and Paste features.

Microsoft Excel records cell addresses in formulas in three different ways, called *absolute*, *relative*, and *mixed*. The way a formula is recorded is important when you copy it. With relative cell addressing, when you copy a formula from one area of the worksheet to another, Excel records the position of the cell relative to the cell that originally contained the formula. With *absolute* cell addressing, when you copy a formula from one area of the worksheet to another, Excel references the same cells, no matter where you copy the formula. You can use mixed cell addressing to keep the row constant while the column changes, or vice versa. The following exercises demonstrate.

Copy, Cut, Paste, and Cell Addressing

1. Move to cell A9.
2. Type **1**. Press Enter. Excel moves down one cell.
3. Type **1**. Press Enter. Excel moves down one cell.
4. Type **1**. Press Enter. Excel moves down one cell.
5. Move to cell B9.
6. Type **2**. Press Enter. Excel moves down one cell.
7. Type **2**. Press Enter. Excel moves down one cell.
8. Type **2**. Press Enter. Excel moves down one cell.

In addition to typing a formula as you did in Lesson 1, you can also enter formulas by using Point mode. When you are in Point mode, you can enter a formula either by clicking on a cell or by using the arrow keys.

1. Move to cell A12.
2. Type =.
3. Use the up arrow key to move to cell A9.
4. Type +.
5. Use the up arrow key to move to cell A10.
6. Type +.
7. Use the up arrow key to move to cell A11.
8. Click the check mark on the Formula bar. Look at the Formula bar. Note that the formula you entered is displayed there.

A	B	C	D	E
9	1	2		
10	1	2		
11	1	2		
12	3			
13				
14				

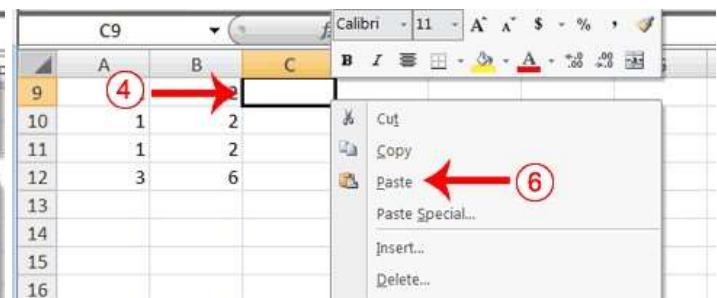
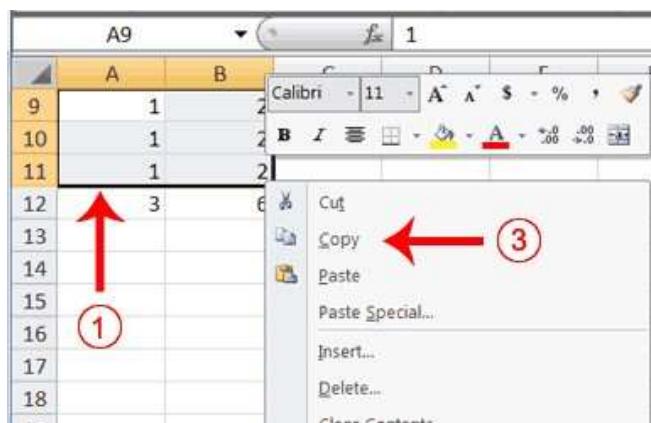
Copy with the Ribbon

To copy the formula you just entered, follow these steps:

1. You should be in cell A12.
2. Choose the Home tab.
3. Click the Copy button in the Clipboard group. Excel copies the formula in cell A12.
4. Press the right arrow key once to move to cell B12.
5. Click the Paste button in the Clipboard group. Excel pastes the formula in cell A12 into cell B12.
6. Press the Esc key to exit the Copy mode.

Compare the formula in cell A12 with the formula in cell B12 (while in the respective cell, look at the Formula bar). The formulas are the same except that the formula in cell A12 sums the entries in column A and the formula in cell B12 sums the entries in column B. The formula was copied in a *relative* fashion.

Before proceeding with the next part of the exercise, you must copy the information in cells A7 to B9 to cells C7 to D9. This time you will copy by using the Mini toolbar.



1. Select cells A9 to B11. Move to cell A9. Press the Shift key. While holding down the Shift key, press the down arrow key twice. Press the right arrow key once. Excel highlights A9 to B11.
2. Right-click. A context menu and a Mini toolbar appear.
3. Click Copy, which is located on the context menu. Excel copies the information in cells A9 to B11.
4. Move to cell C9.
5. Right-click. A context menu appears.
6. Click Paste. Excel copies the contents of cells A9 to B11 to cells C9 to C11.

	A	B	C	D	E
9	1	2	1	2	
10	1	2	1	2	
11	1	2	1	2	
12	3	6			
13					
14					
15					
16					

7. Press Esc to exit Copy mode.

Absolute Cell Addressing

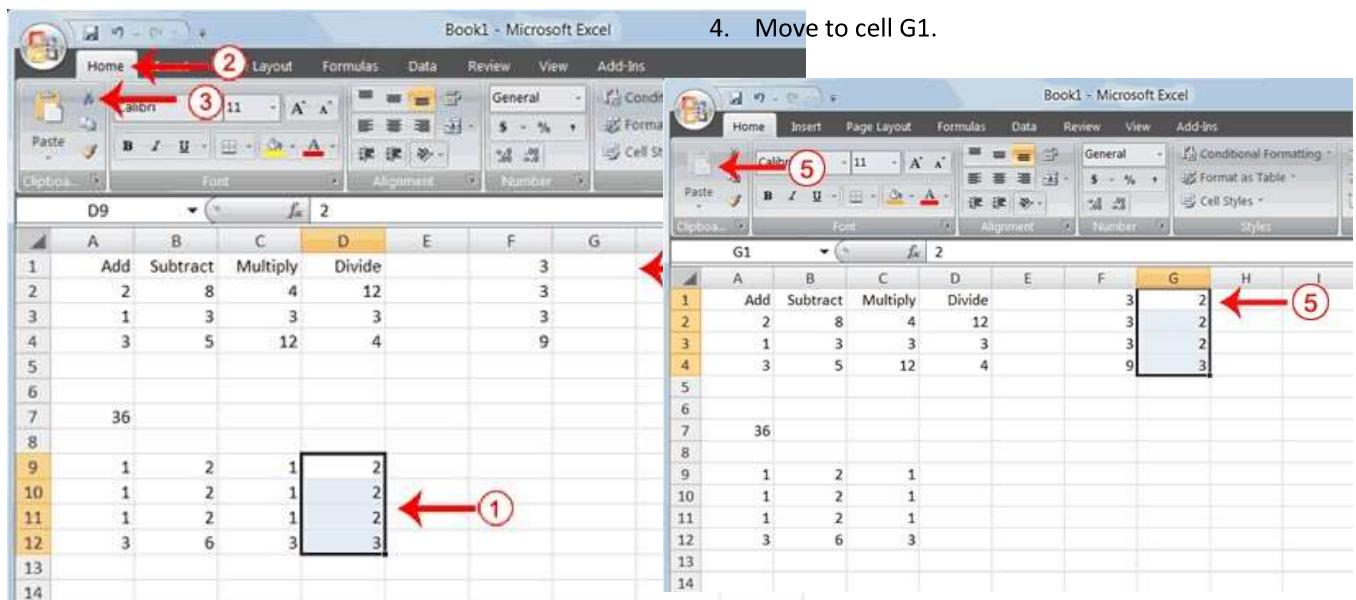
You make a cell address an absolute cell address by placing a dollar sign in front of the row and column identifiers. You can do this automatically by using the F4 key. To illustrate:

1. Move to cell C12.
2. Type =.
3. Click cell C9.
4. Press F4. Dollar signs appear before the C and the 9.
5. Type +.
6. Click cell C10.
7. Press F4. Dollar signs appear before the C and the 10.
8. Type +.
9. Click cell C11.
10. Press F4. Dollar signs appear before the C and the 11.
11. Click the check mark on the formula bar. Excel records the formula in cell C12.

	A	B	C	D	E	F
9	1	2	1	2		
10	1	2	1	2		
11	1	2	1	2		
12	3	6	3			
13						
14						

Cut and Paste

You can move data from one area of a worksheet to another.



1. Select cells D9 to D12
2. Choose the Home tab.
3. Click the Cut  button.
4. Move to cell G1.
5. Click the Paste button . Excel moves the contents of cells D9 to D12 to cells G1 to G4.

The keyboard shortcut for Cut is **Ctrl+x**. The steps for cutting and pasting with a keyboard shortcut are:

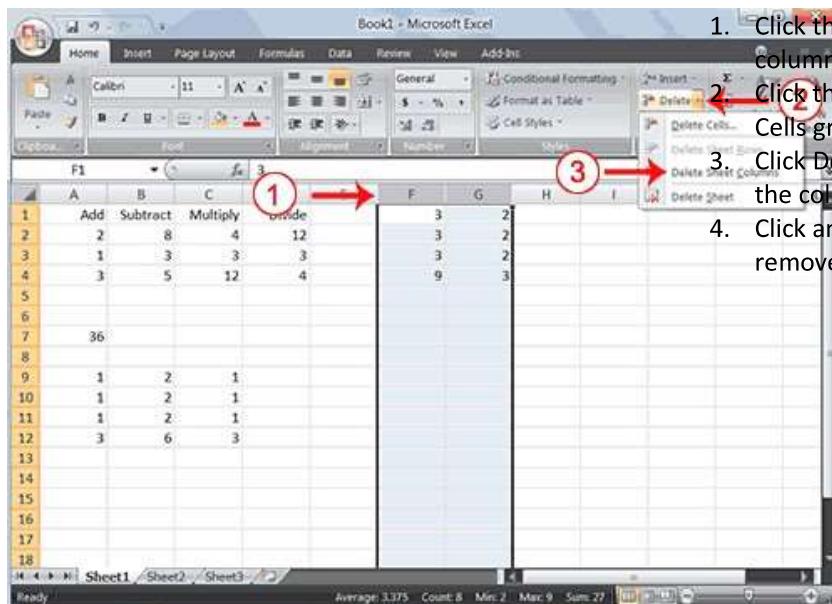
1. Select the cells you want to cut and paste.
2. Press **Ctrl+x**.
3. Move to the upper-left corner of the block of cells into which you want to paste.
4. Press **Ctrl+v**. Excel cuts and pastes the cells you selected.

Insert and Delete Columns and Rows

You can insert and delete columns and rows. When you delete a column, you delete everything in the column from the top of the worksheet to the bottom of the worksheet. When you delete a row, you delete the entire row from left to right. Inserting a column or row inserts a completely new column or row.

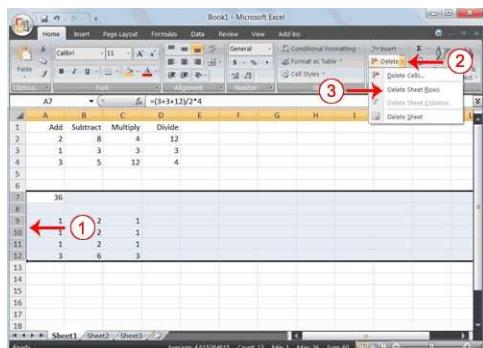
Insert and Delete Columns and Rows

To delete columns F and G:



1. Click the column F indicator and drag to column G.
2. Click the down arrow next to Delete in the Cells group. A menu appears.
3. Click Delete Sheet Columns. Excel deletes the columns you selected.
4. Click anywhere on the worksheet to remove your selection.

To delete rows 7 through 12:



1. Click the row 7 indicator and drag to row 12.
2. Click the down arrow next to Delete in the Cells group. A menu appears.
3. Click Delete Sheet Rows. Excel deletes the rows you selected.
4. Click anywhere on the worksheet to remove your selection.

To insert a column:

1. Click on A to select column A.
2. Click the down arrow next to Insert in the Cells group. A menu appears.
3. Click Insert Sheet Columns. Excel inserts a new column.
4. Click anywhere on the worksheet to remove your selection.

To insert rows:

1. Click on 1 and then drag down to 2 to select rows 1 and 2.
2. Click the down arrow next to Insert in the Cells group. A menu appears.
3. Click Insert Sheet Rows. Excel inserts two new rows.
4. Click anywhere on the worksheet to remove your selection.

Your worksheet should look like the one shown here.

Create Borders

You can use borders to make entries in your Excel worksheet stand out. You can choose from several types

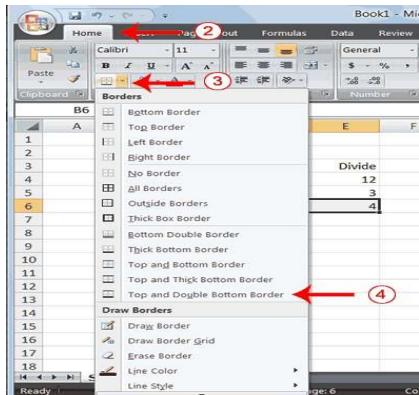
	A	B	C	D	E	F	G
1							
2							
3		Add	Subtract	Multiply	Divide		
4		2	8	4	12		
5		1	3	3	3		
6		3	5	12	4		
7							
8							

of borders. When you press the down arrow next to the Border button , a menu appears. By making the proper selection from the menu, you can place a border on the top, bottom, left, or right side of the selected cells; on all sides; or around the outside border. You can have a thick outside border or a border with a single-line top and a double-line bottom. Accountants usually place a single underline above a final number and a double underline below. The following illustrates:

Create Borders

	A	B	C	D	E	F	G
1							
2							
3		Add	Subtract	Multiply	Divide		
4		2	8	4	12		
5		1	3	3	3		
6		3	5	12	4		
7							
8							

1. Select cells B6 to E6.



2. Choose the Home tab.
3. Click the down arrow next to the Borders button . A menu appears.
4. Click Top and Double Bottom Border. Excel adds the border you chose to the selected cells.

	A	B	C	D	E	F	G
1							
2							
3		Add	Subtract	Multiply	Divide		
4		2	8	4	12		
5		1	3	3	3		
6		3	5	12	4		
7							
8							

Merge and Center

Sometimes, particularly when you give a title to a section of your worksheet, you will want to center a piece of text over several columns or rows. The following example shows you how.

Merge and Center

The screenshot shows the Microsoft Excel ribbon with the 'Home' tab selected. In the formula bar, 'Sample Worksheet' is typed. The range B2 to E2 is selected. Step 3 is highlighted with a red arrow pointing to the selected cells. Step 5 is highlighted with a red arrow pointing to the 'Home' tab. Step 6 is highlighted with a red arrow pointing to the 'Merge and Center' button in the Alignment group of the ribbon.

	B	C	D	E
1	Sample Worksheet			
2	Add	Subtract	Multiply	Divide
3	2	8	4	12
4	1	3	3	3
5	3	5	12	4

1. Go to cell B2.

Note: To unmerge cells:

1. Select the cell you want to unmerge.
2. Choose the Home tab.
3. Click the down arrow next to the Merge and Center button. A menu appears.
4. Click Unmerge Cells. Excel unmerges the cells.
- 5.

Add Background Color

To make a section of your worksheet stand out, you can add background color to a cell or group of cells.

Add Background Color

The screenshot shows the Microsoft Excel ribbon with the 'Home' tab selected. The range B2 to E3 is selected. Step 1 is highlighted with a red arrow pointing to the selected cells.

	B	C	D	E
1				
2	Sample Worksheet			
3	Add	Subtract	Multiply	Divide
4	2	8	4	12
5	1	3	3	3
6	3	5	12	4

1. Select cells B2 to E3.
2. Choose the Home tab.
3. Click the down arrow next to the Fill Color button.
4. Click the color dark blue. Excel places a dark blue background in the cells you selected.

The screenshot shows the Microsoft Excel ribbon with the 'Home' tab selected. The range B2 is selected. Step 2 is highlighted with a red arrow pointing to the 'Home' tab. Step 3 is highlighted with a red arrow pointing to the 'Fill Color' button. Step 4 is highlighted with a red arrow pointing to the dark blue color in the 'Standard Colors' palette. The result shows the cells B2 to E3 have a dark blue background.

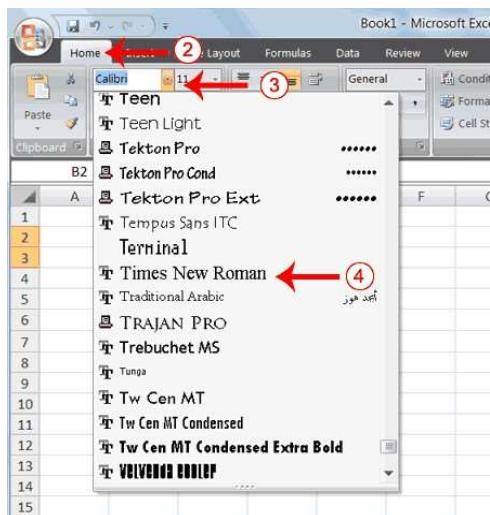
	B	C	D	E
1				
2	Sample Worksheet			
3	Add	Subtract	Multiply	Divide
4	2	8	4	12
5	1	3	3	3
6	3	5	12	4

Change the Font, Font Size, and Font Color

A font is a set of characters represented in a single typeface. Each character within a font is created by using the same basic style. Excel provides many different fonts from which you can choose. The size of a font is measured in points. There are 72 points to an inch. The number of points assigned to a font is based on the distance from the top to the bottom of its longest character. You can change the Font, Font Size, and Font Color of the data you enter into Excel.

Change the Font

1. Select cells B2 to E3.



2. Choose the Home tab.
3. Click the down arrow next to the Font box. A list of fonts appears. As you scroll down the list of fonts, Excel provides a preview of the font in the cell you selected.
4. Find and click Times New Roman in the Font box. **Note:** If Times New Roman is your default font, click another font. Excel changes the font in the selected cells.

Change the Font Size

1. Select cell B2.
2. Choose the Home tab.
3. Click the down arrow next to the Font Size box. A list of font sizes appears. As you scroll up or down the list of font sizes, Excel provides a preview of the font size in the cell you selected.
4. Click 26. Excel changes the font size in cell B2 to 26.

Change the Font Color

2. Choose the Home tab.

3. Click the down arrow next to the Font Color button

4. Click on the color white. Your font color changes to white.

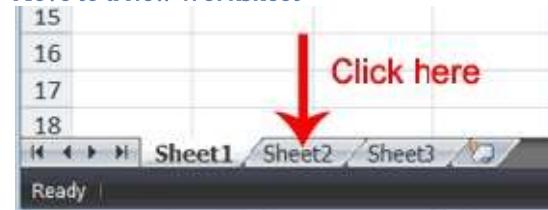
1. Select cells B2 to E3.

Your worksheet should look like the one shown here

Move to a New Worksheet

In Microsoft Excel, each workbook is made up of several worksheets. Each worksheet has a tab. By default, a workbook has three sheets and they are named sequentially, starting with Sheet1. The shows you how.

name of the worksheet appears on the tab. Before moving to the next topic, move to a new worksheet. The exercise that follows

Move to a New Worksheet

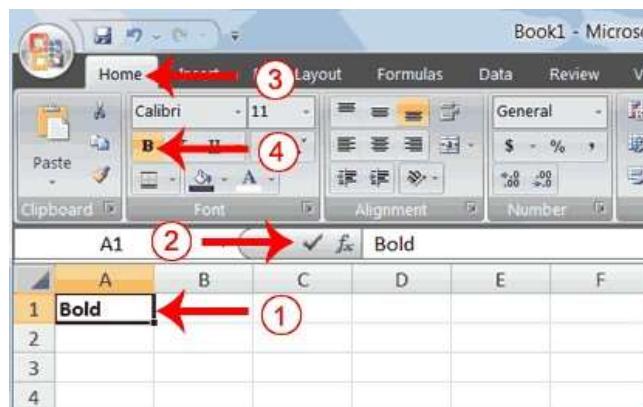
- Click Sheet2 in the lower-left corner of the screen. Excel moves to Sheet2.

Bold, Italicize, and Underline

When creating an Excel worksheet, you may want to emphasize the contents of cells by bolding, italicizing, and/or underlining. You can easily bold, italicize, or underline text with Microsoft Excel. You can also combine these features—in other words, you can bold, italicize, and underline a single piece of text.

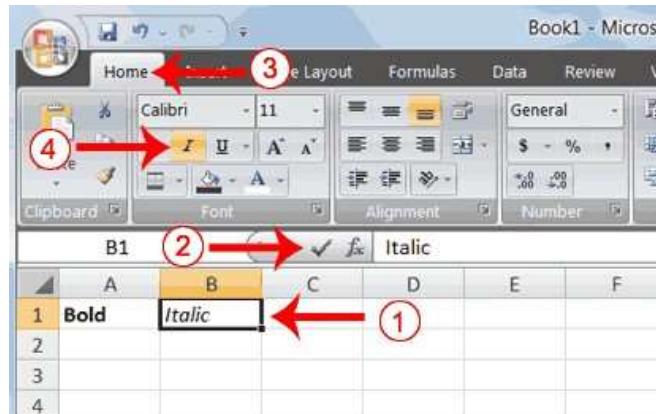
In the exercises that follow, you will learn different methods you can use to bold, italicize, and underline.

Bold with the Ribbon



- Type **Bold** in cell A1.

Italicize with the Ribbon



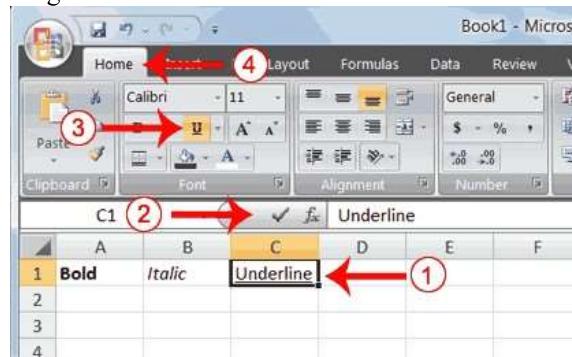
- Click the check mark located on the Formula bar.
- Choose the Home tab.
- Click the Bold button **B**. Excel bolds the contents of the cell.
- Click the Bold button **B** again if you wish to remove the bold.

- Type **Italic** in cell B1.
- Click the check mark located on the Formula bar.
- Choose the Home tab.
- Click the Italic button **I**. Excel italicizes the contents of the cell.
- Click the Italic button **I** again if you wish to remove the italic.

Underline with the Ribbon

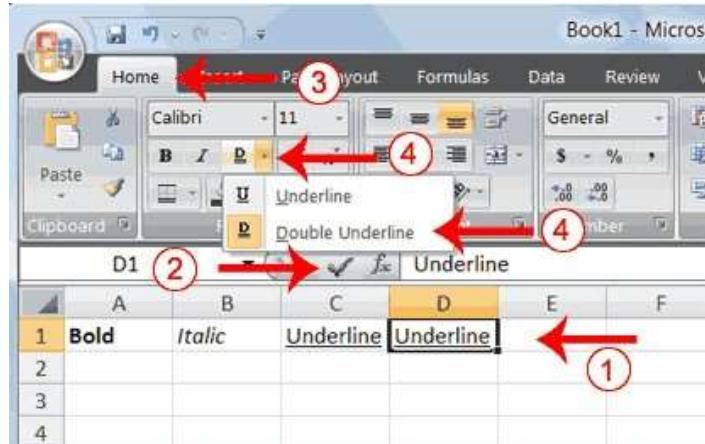
Microsoft Excel provides two types of underlines. The exercises that follow illustrate them.

Single Underline:



- Type **Underline** in cell C1.
- Click the check mark located on the Formula bar.
- Choose the Home tab.
- Click the Underline button **U**. Excel underlines the contents of the cell.
- Click the Underline button **U** again if you wish to remove the underline.

Double Underline



1. Type **Underline** in cell D1.
2. Click the check mark located on the Formula bar.

3. Choose the Home tab.
4. Click the down arrow next to the Underline button and then click Double Underline. Excel double-underlines the contents of the cell. Note that the Underline button changes to the button shown here , a D with a double underline under it. Then next time you click the Underline button, you will get a double underline. If you want a single underline, click the down arrow next to the Double Underline button and then choose Underline.

5. Click the double underline button again if you wish to remove the double underline.

Bold, Underline, and Italicize

1. Type **All three** in cell E1.
2. Click the check mark located on the Formula bar.
3. Choose the Home tab.
4. Click the Bold button . Excel bolds the cell contents.

5. Click the Italic button . Excel italicizes the cell contents.
6. Click the Underline button . Excel underlines the cell contents

Work with Long Text

Whenever you type text that is too long to fit into a cell, Microsoft Excel attempts to display all the text. It left-aligns the text regardless of the alignment you have assigned to it, and it borrows space from the blank cells to the right. However, a long text entry will never write over cells that already contain entries—instead, the cells that contain entries cut off the long text. The following exercise illustrates this.

Work with Long Text

A	B	C	D	E	F	G
6 Now is the time for all good men to go to the aid of their army.						
7						
8						
9						

1. Move to cell A6.
2. Type **Now is the time for all good men to go to the aid of their army.**
3. Press Enter. Everything that does not fit into cell A6 spills over into the adjacent cell.

A	B	C	D	E	F	G	H
6 Now is the Test							
7							
8							
9							

4. Move to cell B6.
5. Type **Test**.
6. Press Enter. Excel cuts off the entry in cell A6.

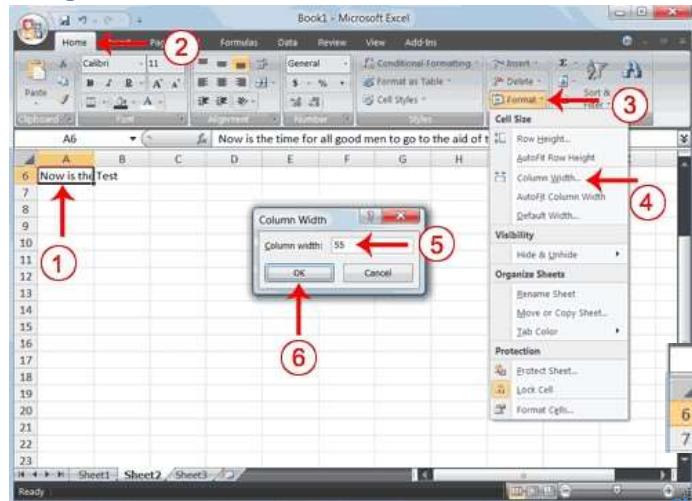
A	B	C	D	E	F	G	H	I
A6 Now is the Test								
7								
8								
9								

7. Move to cell A6.
8. Look at the Formula bar. The text is still in the cell.

Change A Column's Width

You can increase column widths. Increasing the column width enables you to see the long text.

Change Column Width



2. Choose the Home tab.
3. Click the down arrow next to Format in the Cells group.
4. Click Column Width. The Column Width dialog box appears.
5. Type **55** in the Column Width field.
6. Click OK. Column A is set to a width of 55. You should now be able to see all of the text.

	A6	Now is the time for all good men to go to the aid of the	B	C
6	Now is the time for all good men to go to the aid of their army.			
7				

Change a Column Width by Dragging

1. Make sure you are in any cell under column A.

You can also change the column width with the cursor.

1. Place the mouse pointer on the line between the B and C column headings. The mouse pointer should look like the one displayed here , with two arrows.
2. Move your mouse to the right while holding down the left mouse button. The

width indicator Width: 20.00 (247 pixels) appears on the screen.

3. Release the left mouse button when the width indicator shows approximately 20. Excel increases the column width to 20.

Format Numbers

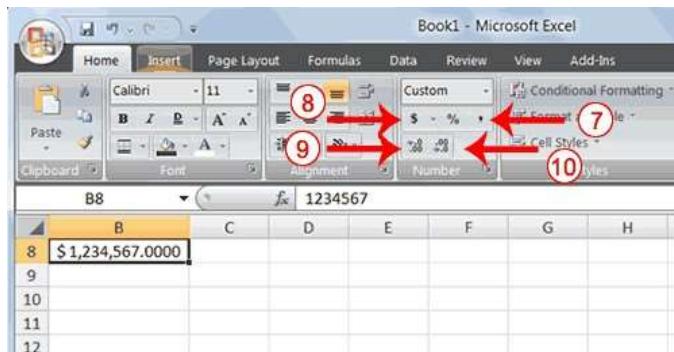
You can format the numbers you enter into Microsoft Excel. For example, you can add commas to separate thousands, specify the number of decimal places, place a dollar sign in front of a number, or display a number as a percent.

Format Numbers

B8	(3)	X ✓ f/x	1234567
B	C	D	E
8 1234567	(1)	(2)	

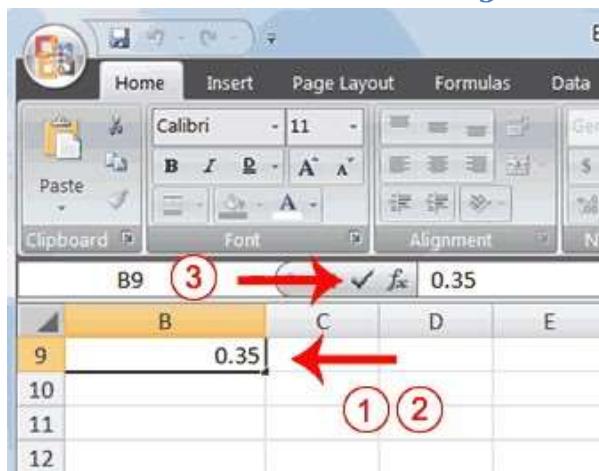
1. Move to cell B8.
2. Type **1234567**.
3. Click the check mark on the Formula bar.

4. Choose the Home tab.
5. Click the down arrow next to the Number Format box. A menu appears.
6. Click Number. Excel adds two decimal places to the number you typed.

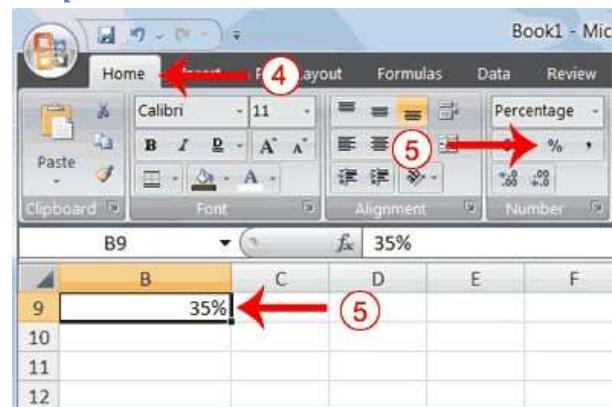


7. Click the Comma Style button . Excel separates thousands with a comma.
8. Click the Accounting Number Format button . Excel adds a dollar sign to your number.
9. Click twice on the Increase Decimal button to change the number format to four decimal places.
10. Click the Decrease Decimal button if you wish to decrease the number of decimal places.

Change a decimal to a percent.



1. Move to cell B9.
2. Type **.35** (note the decimal point).
3. Click the check mark on the formula bar.



4. Choose the Home tab.
5. Click the Percent Style button . Excel turns the decimal to a percent.

Creating Excel Functions and Filling Cells

By using functions, you can quickly and easily make many useful calculations, such as finding an average, the highest number, the lowest number, and a count of the number of items in a list. Microsoft Excel has many functions that you can use.

Using Reference Operators

To use functions, you need to understand reference operators. Reference operators refer to a cell or a group of cells. There are two types of reference operators: *range* and *union*.

A range reference refers to all the cells between and including the reference. A range reference consists of two cell addresses separated by a colon. The reference A1:A3 includes cells A1, A2, and A3. The reference A1:C3 includes cells A1, A2, A3, B1, B2, B3, C1, C2, and C3.

A union reference includes two or more references. A union reference consists of two or more numbers, range references, or cell addresses separated by a comma. The reference A7,B8:B10,C9,10 refers to cells A7, B8 to B10, C9 and the number 10.

Understanding Functions

Functions are prewritten formulas. Functions differ from regular formulas in that you supply the value but not the operators, such as +, -, *, or /. For example, you can use the SUM function to add. When using a function, remember the following:

Use an equal sign to begin a formula.

Specify the function name.

Enclose arguments within parentheses. Arguments are values on which you want to perform the calculation. For example, arguments specify the numbers or cells you want to add.

Use a comma to separate arguments.

Here is an example of a function:

=SUM(2,13,A1,B2:C7)

In this function:

The equal sign begins the function.

SUM is the name of the function.

2, 13, A1, and B2:C7 are the arguments.

Parentheses enclose the arguments.

Commas separate the arguments.

After you type the first letter of a function name, the AutoComplete list appears. You can double-click on an item in the AutoComplete list to complete your entry quickly. Excel will complete the function name and enter the first parenthesis.

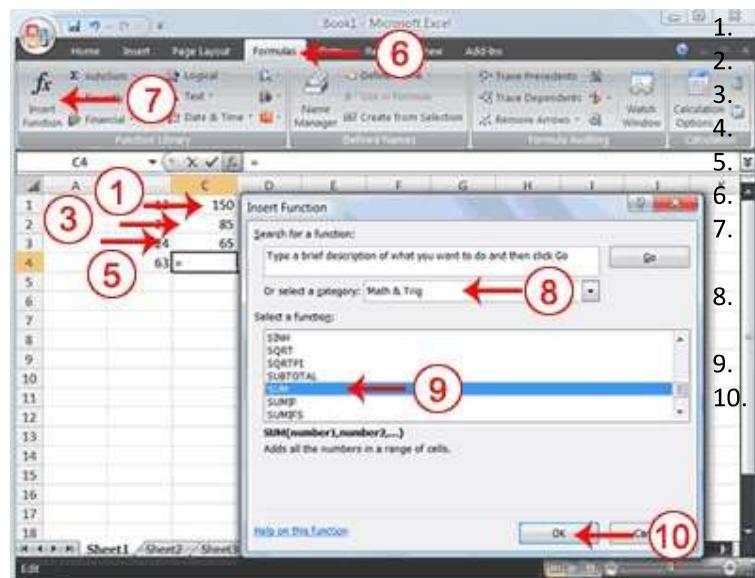
Functions

The SUM function adds argument values.

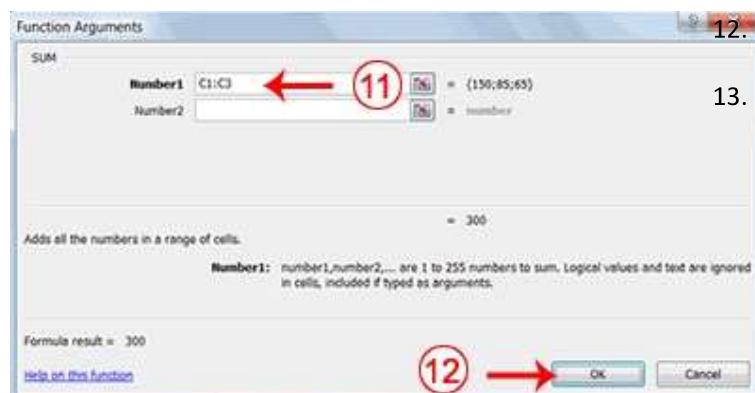
	B4	=SUM(B1:B3)		
A	B	C	D	E
1		12		
2		27		
3		24		
4		63		
5				
6				

1. Open Microsoft Excel.
2. Type **12** in cell B1.
3. Press Enter.
4. Type **27** in cell B2.
5. Press Enter.
6. Type **24** in cell B3.
7. Press Enter.
8. Type **=SUM(B1:B3)** in cell A4.
9. Press Enter. The sum of cells B1 to B3, which is 63, appears.

Alternate Method: Enter a Function with the Ribbon



1. Type **150** in cell C1.
2. Press Enter.
3. Type **85** in cell C2.
4. Press Enter.
5. Type **65** in cell C3.
6. Choose the Formulas tab.
7. Click the Insert Function button. The Insert Function dialog box appears.
8. Choose Math & Trig in the Or Select A Category box.
9. Click Sum in the Select A Function box.
10. Click OK. The Function Arguments dialog box appears.



11. Type **C1:C3** in the Number1 field, if it does not automatically appear.
12. Click OK. The sum of cells C1 to C3, which is 300, appears.

Format worksheet

	A	B	C	D
1		12	150	
2		27	85	
3		24	65	
4	Sum	63	300	
5				
6				

1. Move to cell A4.
2. Type the word **Sum**.
3. Select cells B4 to C4.
4. Choose the Home tab.
5. Click the down arrow next to the Borders button .

6. Click Top and Double Bottom Border.

As you learned in Lesson 2, you can also calculate a sum by using the AutoSum button .

Calculate an Average

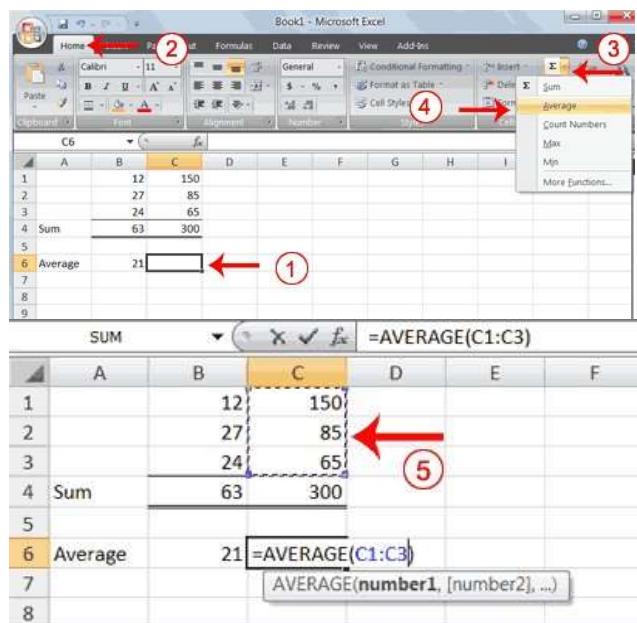
You can use the AVERAGE function to calculate the average of a series of numbers.

	B6		=AVERAGE(B1:B3)	
1		12	150	
2		27	85	
3		24	65	
4	Sum	63	300	
5				
6	Average	21		
7				

1. Move to cell A6.
2. Type **Average**. Press the right arrow key to move to cell B6.
3. Type **=AVERAGE(B1:B3)**.
4. Press Enter. The average of cells B1 to B3, which is 21, appears.

Calculate an Average with the AutoSum Button

In Microsoft Excel, you can use the AutoSum button  to calculate an average.



The screenshot shows two parts of the Microsoft Excel interface. The top part shows the Home tab selected, and the AutoSum button (Σ) is highlighted with a red circle. The formula bar shows =AVERAGE(B1:B3). The bottom part shows the result of the calculation: cell C6 contains the value 21, and the formula bar shows =AVERAGE(C1:C3). Red arrows numbered 1 through 5 indicate the following steps:

1. Click on cell C6.
2. Click on the Home tab.
3. Click the down arrow next to the AutoSum button.
4. Click on the Average option in the dropdown menu.
5. Click on cell C1.

1. Move to cell C6.
2. Choose the Home tab.
3. Click the down arrow next to the AutoSum button .
4. Click Average.
5. Select cells C1 to C3.
6. Press Enter. The average of cells C1 to C3, which is 100, appears.

Find the Lowest Number

You can use the MIN function to find the lowest number in a series of numbers.

		B7		=MIN(B1:B3)	1. Move to cell A7.
1			C		2. Type Min.
2		12	150		3. Press the right arrow key to move to cell B7.
3		27	85		4. Type =MIN(B1:B3).
4	Sum	24	65		5. Press Enter. The lowest number in the series, which is 12, appears.
5					
6	Average	63	300		
7	Min	12			
8					
9					

Note: You can also use the drop-down button next to the AutoSum button  to calculate minimums, maximums, and counts.

Find the Highest Number

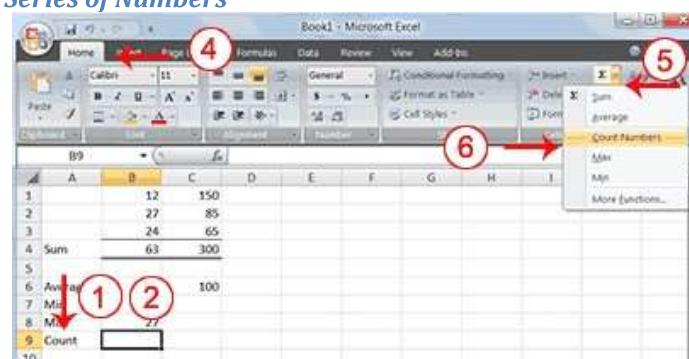
You can use the MAX function to find the highest number in a series of numbers.

		B8		=MAX(B1:B3)	1. Move to cell A8.
1			C		2. Type Max.
2		12	150		3. Press the right arrow key to move to cell B8.
3		27	85		4. Type =MAX(B1:B3).
4	Sum	24	65		5. Press Enter. The highest number in the series, which is 27, appears
5					
6	Average	63	300		
7	Min	12			
8	Max	27			
9					

6. .

Count the Numbers in a Series of Numbers

You can use the count function to count the number of numbers in a series.



1. Move to cell A9.
2. Type **Count**.
3. Press the right arrow key to move to cell B9.
4. Choose the Home tab.
5. Click the down arrow next to the AutoSum button .
6. Click Count Numbers. Excel places the count function in cell C9 and takes a guess at which cells you want to count. The guess is incorrect, so you must select the proper cells.

B9					
					=COUNT(B1:B3)
1	12	150			
2	27	85			
3	24	65			
4 Sum	63	300			
5					
6 Average	21	100			
7 Min	12				
8 Max	27				
9 Count	3				
10					
11					

SUM	X ✓ fx	=COUNT(B1:B3)
A	B	C
1	12	150
2	27	85
3	24	65
4 Sum	63	300
5		
6 Average	21	100
7 Min	12	
8 Max	27	
9 Count	=COUNT(B1:B3)	
10	COUNT(value1, [value2], ...)	
11		

Fill Cells Automatically

You can use Microsoft Excel to fill cells automatically with a series. For example, you can have Excel automatically fill your worksheet with days of the week, months of the year, years, or other types of series.

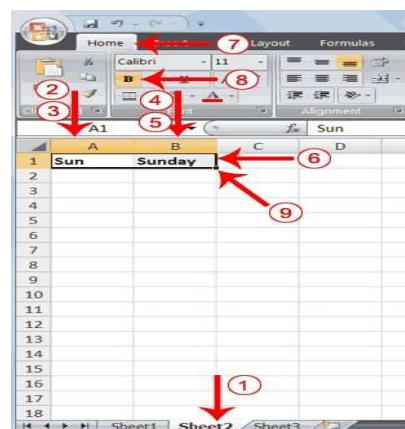
Fill Cells Automatically

The following demonstrates filling the days of the week:

	A	B	C	D
1	Sun	Sunday		
2	Mon	Monday		
3	Tue	Tuesday		
4	Wed	Wednesday		
5	Thu	Thursday		
6	Fri	Friday		
7	Sat	Saturday		
8	Sun	Sunday		
9	Mon	Monday		
10	Tue	Tuesday		
11	Wed	Wednesday		
12	Thu	Thursday		
13	Fri	Friday		
14	Sat	Saturday		
15				
16				
17				
18				

Auto Fill Options Button

- Click the Sheet2 tab. Excel moves to Sheet2.
- Move to cell A1.
- Type Sun.
- Move to cell B1.
- Type Sunday.
- Select cells A1 to B1.
- Choose the Home tab.
- Click the Bold button . Excel bolds cells A1 to B1.



- Find the small black square in the lower-right corner of the selected area. The small black square is called the fill handle.
- Grab the fill handle and drag with your mouse to fill cells A1 to B14. Note how the days of the week fill the cells in a series. also, note that the Auto Fill Options button appears.

Copy Cells

	A	B	C	D	E
1	Sun	Sunday			
2	Sun	Sunday			
3	Sun	Sunday			
4	Sun	Sunday			
5	Sun	Sunday			
6	Sun	Sunday			
7	Sun	Sunday			
8	Sun	Sunday			
9	Sun	Sunday			
10	Sun	Sunday			
11	Sun	Sunday			
12	Sun	Sunday			
13	Sun	Sunday			
14	Sun	Sunday			
15					
16					
17					
18					

- Click the Auto Fill Options button. The Auto Fill Options menu appears.
- Click the Auto Fill Options button again.
- Choose the Copy Cells radio button. The cells fill as a series from Sunday to Saturday again.

Sunday to Saturday, but the entries are not bolded.

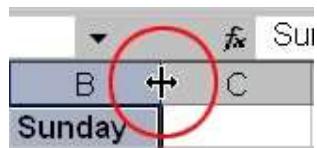
- Click the Auto Fill Options button again.

- Choose the Copy Cells radio button. The entry in cells A1 and B1 are copied to all the highlighted cells.
- Click the Auto Fill Options button again.
- Choose the Fill Without Formatting radio button. The cells fill as a series from Monday to Friday.
- Choose the Fill Weekdays radio button. The cells fill as a series from Monday to Friday.

Adjust Column Width

Some of the entries in column B are too long to fit in the column. You can quickly adjust the column width to fit the longest entry.

1. Move your mouse pointer over the line that separates column B and C. The Width Indicator appears.



2. Double-click. The Column adjusts to fit the longest entry.

After you complete the remainder of the exercise, your worksheet will look like the one shown here.

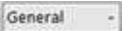
	A	B	C	D	E	F
1	Sun	Sunday	1:00:00 AM	1	Lesson 1	
2	Mon	Monday	2:00:00 AM	2	Lesson 2	
3	Tue	Tuesday	3:00:00 AM	3	Lesson 3	
4	Wed	Wednesday	4:00:00 AM	4	Lesson 4	
5	Thu	Thursday	5:00:00 AM	5	Lesson 5	
6	Fri	Friday	6:00:00 AM	6	Lesson 6	
7	Mon	Monday	7:00:00 AM	7	Lesson 7	
8	Tue	Tuesday	8:00:00 AM	8	Lesson 8	
9	Wed	Wednesday	9:00:00 AM	9	Lesson 9	
10	Thu	Thursday	10:00:00 AM	10	Lesson 10	
11	Fri	Friday	11:00:00 AM	11	Lesson 11	
12	Mon	Monday	12:00:00 PM	12	Lesson 12	
13	Tue	Tuesday	1:00:00 PM	13	Lesson 13	
14	Wed	Wednesday	2:00:00 PM	14	Lesson 14	
15						

Fill Times

The following demonstrates filling time:

1. Type **1:00** into cell C1.
2. Grab the fill handle and drag with your mouse to highlight cells C1 to C14. Note that each cell fills, using military time.
3. Press Esc and then click anywhere on the worksheet to remove the highlighting.

To change the format of the time:

1. Select cells C1 to C14.
2. Choose the Home tab.
3. Click the down arrow next to the number format box . A menu appears.
4. Click Time. Excel changes the format of the time.

Exercise 1

How many ways to make 12?

Create a sheet that has four tables as shown below. The sheet determines how many different ways can you calculate the number 12. Fill in numbers in the tables to add, subtract, multiply, and divide to equal 12.

Exercise 2

ATTENDANCE SHEET

Create a sheet as shown below. The sheet determines the count of „P” for each student. Also use a formula to calculate percentage.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2															
3															
4															
5															
6	Roll No	Name	1	2	3	4	5	6	7	8	9	10	Total Attendance	% age	
7	1	Asim	P	P	P	A	P	P	P	P	P	P			
8	2	Bilal	P	A	A	P	P	P	P	A	P	P			
9	3	Danish	A	A	A	P	P	P	A	A	P	P			
10	4	Ejaz	P	A	A	A	P	P	P	A	P	P			
11	5	Faraz	A	P	P	A	P	P	A	P	P	P			
12	6	Amjad	A	P	P	P	P	P	A	P	P	P			
13	7	Shuja	A	A	A	P	P	P	A	A	P	P			
14	8	Sajjad	P	A	P	P	P	P	P	A	P	P			
15	9	Imran	P	P	P	P	P	P	P	P	P	P			
16	10	Irfan	A	P	P	P	P	P	A	P	P	P			

Lab Session 09

OBJECT

Working with conditions, logical & Trigonometric functions in Microsoft Excel

Entering Formulas

Formulas enable the user to perform calculations by using values in the worksheet. Arithmetic operators that can be used in formulas include + for addition, - for subtraction, * for multiplication, / for division, % for percentage, and ^ for exponentiation. For example: =a1+b1 adds the contents of a1 and b1 in the cell where the formula is typed.

To fill the same formula in multiple cells, select the adjacent cells or ranges to be filled; With the range(s) still selected, type the formula or value in the active cell; Press Ctrl+Enter (rather than just Enter) to enter the formula or value.

To reference cells in other Worksheets, select the cell where the formula is to be appeared , and type an equal sign (=) to start the formula; Click the sheet tab containing the cell to be referenced in the formula; Select the cell or range to be referred to. The complete reference appears in the formula bar; Finish the rest of the formula; then press Enter to complete the formula.

Excel also provides functions like SUM, AVERAGE, etc. Select the cell where the function is to be appeared, and type an equal sign (=) to start the function; Type the function name (such as SUM, AVERAGE, etc) and a left parenthesis; Select the range of cells for the argument and press Enter. Excel automatically adds the closing parenthesis and enters the function. References to columns or rows can also be entered manually, using commas (,) for separation. If colon (:) is used between two references then, it acts as range operator, which produces one reference to all the cells between two references, including the two reference. Following are some of the most commonly used formula.

- **SUM:** Adds all the numbers in a range of cells.
Syntax: =SUM(number1, number2,)
- **AVERAGE:** Returns the average (arithmetic mean) of the arguments.
Syntax: =AVERAGE(number1, number2,)
- **COUNT:** Counts the number of cells that contain numbers and numbers within the list of arguments.
Syntax: =COUNT(value1, value2,)
- **COUNTA:** Counts the number of cells that are not empty and the values within the list of arguments.
Syntax: =COUNTA(value1, value2,)
- **PRODUCT:** Multiplies all the numbers given as arguments and returns the product.
Syntax: =PRODUCT(number1, number2,)

SUM PRODUCT FUNCTION: Calculate the product and then return the total sum of the product.

Formula	Description	Result
=SUMPRODUCT(A2:A4, B2:B4)	Multiples all the components of the two	=SUMPRODUCT(A2:A4, B2:B4)

SUMIF: Adds the cells specified by a given criteria.

Syntax: SUMIF(range, criteria, sum_range)

Where 'Range' is the range of cells to be evaluated according to the given criteria. 'Criteria' is the criteria in the form of a number, expression, or text that defines which cells will be added. 'Sum_range' are the actual cells to sum. The cells in sum_range are summed only if their corresponding cells in range match the criteria. If sum_range is omitted, the cells in range are summed.

EmpID	Emp Name	Designation	BASIC	HRA	DA	MA	PF	Gross Salary	Net Salary
101.00	AAA	Manager	12000	2160.00	14400.00	1000.00	9600.00	7960.00	19960.00
102.00	BBB	CEO	15000	2700.00	18000.00	1000.00	12000.00	9700.00	24700.00
103.00	CCC	Accountant	11000	1980.00	13200.00	1000.00	8800.00	7380.00	18380.00
104.00	DDD	Clerk	3000	540.00	3600.00	500.00	2400.00	2240.00	5240.00
105.00	EEEE	Peon	1500	270.00	1800.00	500.00	1200.00	1370.00	2870.00
106.00	FFFF	Manager	13000	2340.00	15600.00	1000.00	10400.00	8540.00	21540.00
107.00	GGGG	Peon	2000	360.00	2400.00	500.00	1600.00	1660.00	3660.00
108.00	HHHH	Clerk	3500	630.00	4200.00	500.00	2800.00	2530.00	6030.00

How to use Sumifs, Countifs

Month	Product	Country	Sales	Revenue
Jan	Shirt white	USA	546	
Jan	Shirt blue	USA	519	
Feb	Shirt white	USA	492	
Feb	Shirt blue	USA	559	
Feb	Shirt white	USA	591	
Feb	Shirt white	USA	535	
Feb	Shirt blue	USA	550	
Feb	Shirt yellow	USA	517	
Feb	Shirt blue	UK	449	
Feb	Shirt white	UK	410	
Mar	Shirt white	UK	435	
Mar	Shirt yellow	USA	468	
Apr	Shirt blue	USA	568	

Find total sales for the below criteria:
 Feb
 Feb Shirt white
 Feb Shirt white USA

=sumifs(D4:D22,A4:A22,G6,B4:B22,H6)

Find out how many shirts were sold for the below criteria:
 Feb
 Feb Shirt white
 Feb Shirt white USA

=countif(A4:A22,G11)

Formulas: Absolute, Relative, and Mixed Cell References

When a cell contains a formula with references to other cells, several methods can be used to handle those references.

Excel normally uses relative references for cell addresses in a formula, unless specified otherwise. When relative references are used, the cell references in a formula automatically adjust after the formula is copied to another cell or range. If cell B10 contains the formula =SUM(B3:B9), for example, and user copies this formula from cell B10 to cell C10, the new formula in cell C10 automatically adjusts to read =SUM(C3:C9).

To prevent a cell reference in a formula from changing when that formula is copied to another cell or range, use an absolute reference. Absolute references can be indicated by typing a dollar sign (\$) in front of the column letter and the row number. In a sales worksheet, for example, if the user have a column of formulas that multiply a value by the commission percentage located in cell D7, he could use \$D\$7 to refer to that percentage in the first cell; then copy the formula down the column.

Combinations of these two types of references called mixed references can also be used. For example \$C3 prevents the column from changing, C\$3 adjusts the column to a new location but the row remains fixed when the formula is copied.

To use this, place the cell pointer in the cell where the formula is to be entered; To enter an absolute or mixed reference in a formula, type an equal sign (=) to start the formula (to enter a relative reference, just type the reference--no special treatment is needed). Then type or click the cell reference; Press F4 until the desired combination of dollar signs appears, and then type the arithmetic operator, such as a plus sign (+); Continue to type other values or cell references and operators as needed; then press Enter to complete the formula

Logical Functions

The logical functions enable the user to add decision-making and logical tests to the worksheets. The IF statement is useful for testing conditions and making decisions based on a cell's contents. The AND and OR functions can test multiple criteria or test conditions for use in IF functions. The following examples show the use:

- 1. `=AND(D15,G23<30)` result is TRUE only when D15 is not zero and G23 is less than 30 OR `=AND(C4>B4,D4="YES")` RESULT IS TRUE comparison of two values

	A	B	C	D	E
1					
2					
3	Division	Budget	Amt Spent	Growth Potential	Needs Review
4	Engines	\$250,000	\$286,000.00	Yes	
5	Wheels	\$75,000	\$71,245.00	Yes	
6	Axles	\$125,000	\$137,456.00	No	
7	Chassis	\$205,000	\$190,000.00	No	
8					
9					<code>=and(C4>B4,D4="yes")</code>
10					

2. IF :AND

`=IF(AND(<Test 1>, <Test 2>, ...), TRUE, FALSE)`

- `=IF(AND(D17>10, D17<30), "Valid", "Invalid")` returns valid if the contents of cell D17 is greater than 10 and less than 30; otherwise the formula returns Invalid

v	Needs Review
	<code>=IF(and(C4>B4,D4="no"),"Review ASAP","No Review Needed")</code>

3. NESTED IF

If Customer Bill
> 20000, "A"
> 10000, "B"
< 10000, "C"
=IF(C2>20000,"A",IF(C2>10000,"B","C"))

- `=IF(OR(D17=10, D17=30), "Contains 10 or 30", "Not 10or30")` tests whether cell D17 contains the result 10 or 30 and produces the message Contains 10 or 30 when it does; otherwise, the formula produces the message Not 10 or 30

Math and Trigonometric Functions

Like logical functions, math and trigonometric functions can also be used in the Worksheets.

Trigonometric functions use angles measured in radians.

Following are some examples:

=Radians(NUMBER) : Convert Degree In To Radian

Tangent:

2 TANGENT:	<input type="text" value="30"/>	=TAN(RADIANS(B2))
3 INVERSE SINE:		RADIANS(angle) angle

Sin Function: =SIN(NUMBER) : sin(radians(30))

- **number** - The angle in radians for which you want the sine.

Inverse sine: Result Will Be In Degrees according to formula given below.

3 INVERSE SINE:	<input type="text" value="0.6"/>	=DEGREES(ASIN(RADIANS(DEGREES(B3))))
4 COSINE:		DEGREES(angle) EES(angle)

Syntax COS

=COS (number) :=Cos(radians(30))

Or =Radians(30) Convert Degree In To Radian

4 COSINE:	<input type="text" value="20"/>	=COS(RADIANS(B4))
-----------	---------------------------------	-------------------

Arguments

- **number** - The angle in radians for which you want the cosine.

ACOS: The Excel ACOS function calculates the arccosine (i.e. the inverse **cosine**) of a given number, and returns an angle, in radians, between 0 and π .

Result In Radian

For degrees =degree(ACOS(RADIAN(DEGREES(30))))

- =ABS(A10)returns 18 when cell A10 contains -18
- =ACOS(0.5)returns 1.047198 (radians)
- =DEGREES(0.5) returns 28.64789 (degrees)
- =ROUND(102.927,2) returns 102.93
- **Mround**

A	B	C	D
	=MROUND(A2,1)		
Number	Formulae	Description	Result
5.1		Rounds Number to the nearest multiple of 1.	=MROUND(A2,1)
7.5		Rounds Number to the nearest multiple of 5.	MROUND(number, multiple)
24		Rounds Number to the nearest multiple of 10.	

EXERCISES

1. Design a TEMPERATURE CONVERTER from Celsius to Fahrenheit and Fahrenheit to Celsius. Present the Converter with appropriate design. Formulas for conversion are as follows:

$$[{}^{\circ}\text{C}] = ([{}^{\circ}\text{F}] - 32) \cdot 5/9$$

$$[{}^{\circ}\text{F}] = [{}^{\circ}\text{C}] \cdot 9/5 + 32$$

Also report the weather conditions as HOT if the temperature exceeds 35°C , WARM if the temperature is between 20°C to 35°C and COLD if the entered temperature is below 20°C .

2. Create a magic square puzzle as per given example below, the sum of all the numbers in a row must be equal, simultaneously the sum of all the numbers in a column must be equal, and the sum of diagonal numbers should also be equal:

- Take the input from the user in all the squares. For a user all the squares will be blank initially and the box given below will contain the text “KEEP TRYING” unless the user enters all correct entries. If user solves the puzzle correctly then a message “WELL DONE” appears below. Format your work accordingly.

1.

12	3	9	
5	8	11	24
7	13	4	24

24	24	24	24
----	----	----	----

WELL DONE!!!

40

Lab Session 10

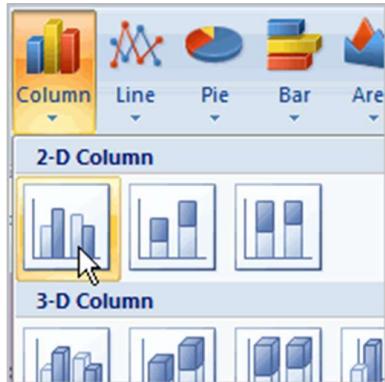
Objective:

Charts and Graphs

To explore different features of Microsoft Excel.

To learn how to depict data graphically.

Introduction



A **chart** is a tool you can use in Excel to communicate your **data graphically**. Charts allow your audience to more easily see the meaning behind the numbers in the spreadsheet, and to make showing comparisons and trends much easier. In this lesson, you will learn how to **insert** and **modify** Excel charts and see how they can be an effective tool for communicating information.

Creating a chart

Charts can be a useful way to communicate data. When you insert a chart in Excel, it appears in the selected worksheet with the source data by default.

To create a chart:

- Select the **worksheet** you want to work with. In this example, we use the **Summary** worksheet.
- Select the **cells** you want to chart, including the **column titles** and **row labels**.
- Click the **Insert** tab.
- Hover over each **Chart option** in the Charts group to learn more about it.
- Select one of the Chart options. In this example, we'll use the Columns command.
- Select a **type of chart** from the list that appears. For this example, we'll use a 2-D Clustered Column. The chart appears in the worksheet.



Identifying the parts of a chart : Have you ever read something you didn't fully understand but when you saw a chart or graph, the concept became clear and understandable? Charts are a **visual representation** of data in a worksheet. Charts make it easy to see comparisons, patterns, and trends in the data.



Source data : The range of cells that make up a chart. The chart is updated automatically whenever the information in these cells changes.

Title

The title of the chart.

Legend

The chart key, which identifies what each color on the chart represents.

Axis

The vertical and horizontal parts of a chart. The vertical axis is often referred to as the Y axis, and the horizontal axis is referred to as the X axis.

Data series

The actual charted values, which are usually rows or columns of the source data.

Value axis

The axis that represents the values or units of the source data.

Category axis

The axis identifying each data series.

Chart tools

Once you insert a chart, a new set of **Chart Tools**, arranged into three tabs, will appear above the Ribbon. These are only visible when the chart is selected.



To change the chart type:

- Select the **Design** tab.
- Click the **Change Chart Type** command. A dialog box appears.

- Select another **chart type**.
- Click OK.

The chart in the example compares each salesperson's monthly sales to his or her other months' sales; however, you can change what is being compared. Just click the **Switch Row/Column Data** command, which will rotate the data displayed on the **x** and **y axes**. To return to the **original view**, click the Switch Row/Column command again.

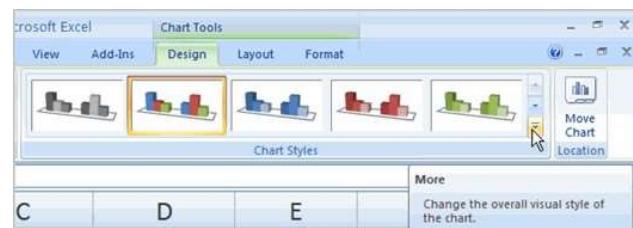
To change chart layout:

- Select the **Design** tab.
- Locate the **Chart Layouts** group.
- Click the **More** arrow to view all of your layout options.
- Left-click a layout to select it.



To change chart style:

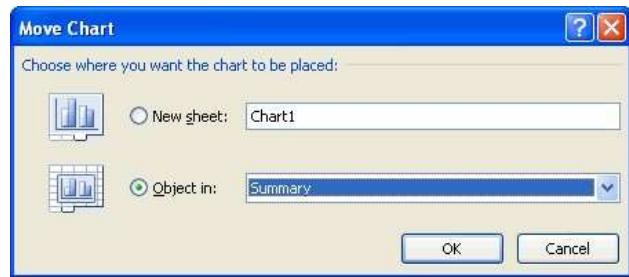
- Select the **Design** tab.
- Locate the **Chart Style** group.
- Click the **More** arrow to view all of your style options.
- Left-click a style to select it.



To move the chart to a different worksheet:

- Select the **Design** tab.
- Click the **Move Chart** command. A dialog box appears. The current location of the chart is selected.

- Select the desired location for the chart (i.e., choose an existing worksheet, or select New Sheet and name it).



Exercise 1

USING RADAR CHART IN EXCEL

Demonstrate the use of Radar & Bar chart by comparing the average monthly temperature of three cities. Label the graph as 'Average Monthly Temperatures'.

	A	B	C	D
1		avg temp Bermuda	avg temp Sydney	Memphi
2	January	65	73	49
3	February	64	73	54
4	March	64	70	63
5	April	67	66	72
6	May	72	59	80
7	June	77	55	89
8	July	80	54	92
9	August	81	57	91
10	September	79	61	85
11	October	75	64	75
12	November	70	68	62
13	December	66	70	52

Exercise 2

TRIGONOMETRIC GRAPHS

Draw a sine ($\sin\Theta$) wave and a cosine ($\cos\Theta$) wave on a single graph. Angle (Θ) ranges from 0° to 360° with the interval of 15° .

Attach the formula sheets also for the sine and cosine chart.