Saving Your Document

If you wish to save the changes you've made to the *Options* spreadsheet, choose the *Save As* command from ParaSheet's Document menu. When the Save panel appears, you'll be prompted to name the document and save it to a specific directory.

Conclusion

In this chapter you've learned several ways to create formulas, how to use the Function panel, as well as the difference between relative and absolute cell references.

Next you'll learn how to insert, delete and rearrange rows and columns in your spreadsheet, how to format the contents of a cell using the Inspector, and how to create reports using ParaSheet's extensive charting options.

1. **Select the cell range C4:D9 by clicking cell C4 and dragging to D9.**
2. **Hold down the Shift key while you select the ranges F4:F9, H4:H9, and J4:J9.**

   If your spreadsheet has different cells selected than the ones shown below, start over from step 1.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260		$0	1	$260
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2	$260	3	$0	4	$260
12										
13										

3. **Select the *Fill Down* command from the Fill submenu.**

   Each car has a total number of options, and a price for that collection of options. Yet you only entered five formulas, and then copied those formulas to other areas.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260		$0	1	$260
5	Air Conditioning	$300	$90	$390		$0		$0	1	$390
6	Cruise Control	$60	$18	$78		$0	1	$78	1	$78
7	Power Antenna	$50	$15	$65		$0	1	$65		$0
8	Leather Seats	$200	$60	$260		$0		$0	1	$260
9	Custom Floor Mats	$50	$15	$65	1	$65	1	$65		$0
10										
11	Totals			$1,118	2	$325	3	$208	4	$988
12										
13										

Your group now has enough information about the competition to decide which options to include in the car you're marketing.

4. Choose *Paste* from the Edit menu (or press Command-v).

Because the Tornado doesn't include power windows as a standard option, $0 appears in cell H4. The Xenon does include the option, so cell J4 displays $260, as shown below:

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260		$0	1	$260
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2	$260	3	$0	4	$260
12										

The $D4 reference in each of these formulas hasn't been adjusted for the new column because you made the original column reference absolute. Next, you'll copy the formula down the columns. The relative row reference in the formula means the row number will be adjusted.

Copying Multiple Selections

You used the *Fill Down* command in the previous chapter to copy down one column at a time. Now you'll copy several columns at once by using the Shift key to make multiple selections.

Select each of the cells where you just copied the formulas to see that the cell references were adjusted. For instance, the formula in G11 was adjusted to refer to column G instead of column E, so it shows a different result in the cell.

Copying Absolute References

You can make any reference unchanging so that no matter where you copy the formula, it will always refer to the original cells. This is called *absolute referencing*.

To make the references in a formula absolute, place a dollar sign ($) before each column and row that you want referenced absolutely. For instance, when you entered the formula containing the IfX function, you typed "$" before the column reference to cell D4.

To see the effect of that absolute reference, follow these steps:

1. **Select cell F4.**
2. **Choose *Copy* from the Edit menu (or press Command-c).**
3. **Click cell H4. Then, hold down the Shift key and click cell J4, so that both cells are selected.**

   In this case, you're using the *Copy* and *Paste* commands to copy into disconnected cells.

Let's now copy the formulas in cells D11 and E11 to see how relative references are adjusted.

The *Copy* and *Paste* commands allow you to copy both of these formulas across the row at the same time. With *Copy* and *Paste*, you can select a range of cells to be copied. Their contents will be pasted repetitively into the destination range until it is filled.

1. Select cells D11 and E11.

These are the formulas containing the Sum and Count functions, respectively.

2. In the Edit menu, choose the *Copy* command.

3. Select cells F11 through J11, as shown below.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260			1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2					
12										

4. Choose *Paste* from the Edit menu.

The formulas are copied in order across the range.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260			1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2	$260	3	$0	4	$0
12										

reference, which is why it is preceded by the dollar sign. Later in this chapter, you'll see examples of how absolute and relative references are copied.

1. Select cell F4.

2. Type "=IfX(E4=1,$D4,0)" and press Enter.

ParaSheet enters the formula, calculates the result, and displays $260 in cell F4.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1	$260			1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2					
12										
13										

Copying Formulas

You're almost finished with the *Options* spreadsheet. Now, we only need to copy the formulas to the rest of the cells that are to be calculated by them.

In the previous chapter you used the *Fill Down* and *Fill Right* commands to copy entries to adjacent cells. In this chapter, you'll use the *Copy* and *Paste* commands for situations in which you can't use the *Fill Down* or *Fill Right* commands.

Copying Relative References

Unless you specify otherwise, all cell references are relative. When you copy formulas containing relative references to another location in the spreadsheet, ParaSheet automatically adjusts the cell references for the new location.

3. **Click *Statistical Functions* in the Categories column, then choose *Count* from the Names column.**

   In the bottom pane of the panel you'll see Count(List) and a description of the Count function.

4. **Click *Insert*.**

   =Count() appears in the input window. Now you need to specify what you want the Count function to operate on.

5. **On the spreadsheet, click and drag to select cells E4 through E9.**

   =Count(E4:E9) appears in the input window.

6. **Press Enter to complete the formula.**

   Cell E11 should now contain the number 2:

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1				1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260	2					
12										
13										

Typing an Absolute Reference

Now you need to fill in each *Price* column for the options actually included with each car. You can accomplish this with one formula.

For example, a formula in cell D4 in the *Cost* column to figure the final cost of power windows to the buyer would be stated as: "If the value of the cell to the left is 1, then get the cost of the option. The cost is always in column D of this row. However, if the value of the cell to the left isn't 1, then enter zero here." ParaSheet expresses this entire statement as *=IfX(E4=1,$D4,0)*.

The "value of the cell to the left" is a *relative* reference, since the row and column you want to find will vary depending on where the formula is placed. Column D, where the cost always appears, is an *absolute*

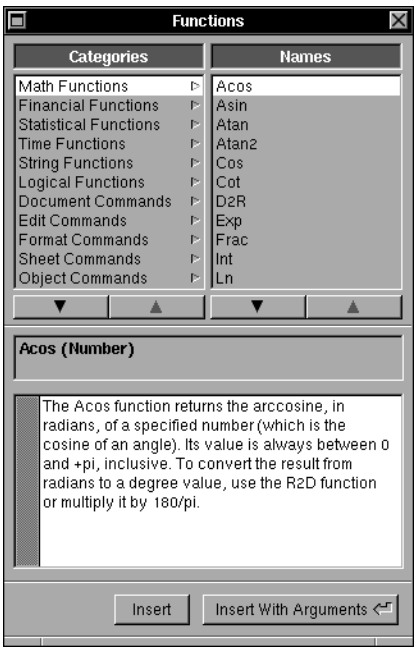
Using the Functions Panel

The Stnd? columns in our spreadsheet show which options are standard on each of three competitive automobiles (Allegro, Tornado, Xenon). To show the total number of standard options for the first car, you'll need to count the number of 1s (meaning the option is included) in column E.

To do this we'll use the *Count* function, which counts the number of numeric values in a range of cells (ignoring text entries or blanks). Later, you'll copy this formula to the other Stnd? columns.

1. Select cell E11.

2. Open the Tools menu and choose the *Functions* command to raise the Functions panel.



The *Functions* panel contains all the functions in ParaSheet divided into categories. (It also includes commands and statements which, with the functions, are part of the WILMA language.)

The panel works like any NEXTSTEP file viewer: after you click the category you want in the left column, the names of functions in that category appear in the right column. Count is one of the *Statistical* functions.

Using a Function in a Formula

ParaSheet includes a wide variety of functions that perform specialized calculations for you. In this section, you'll enter formulas that include the Sum, Count, and IfX functions. At the same time, you'll learn about three more ways to enter formulas.

Selecting a Range

After you copy the formula in cell D4 down its column, you'll want to total the cost of all options. To find that total, you could enter this formula: *=D4+D5+D6+D7+D8+D9*. Instead, the Sum function adds each value in a range of cells. You'll click and drag the range to select it.

1. **Select cell D11.**
2. **Type "=Sum(" to begin entering the formula.**

   =Sum(appears in the input window. Be sure to type the left parenthesis before selecting the range.
3. **Click cell D4 and without letting go, drag to D9.**

   =Sum(D4:D9 appears in the input window.
4. **Type ")" to complete the range reference. Then press Enter to complete the formula.**

   Cell D11 should now contain $260.

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1				1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals			$260						
12										
13										

Because the formula refers to a range of cells (D4:D9), the result will change when you later add values to the other cells in column D.

Pointing to Cells

Now we need to add the cost to the margin to figure the total price.

1. Select cell D4.

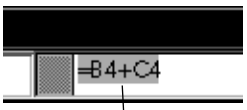
2. Type "=" to begin entering the formula.

3. Click cell B4.

=B4 appears in the input window. The cell reference for the cell you click is automatically included in the formula.

4. Click cell C4.

=B4+C4 appears in the input window, as shown below. There is no need to type the +.



Plus sign is automatically entered.

Note *If a formula requires the / (division), * (multiplication), or - (subtraction) symbol before the cell reference, type that symbol first. Then when you point to the cell, the plus sign isn't entered.*

5. Press Enter to complete the formula.

Cell D4 should now contain $260:

Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60	$260	1				1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals									
12										

Entering Simple Formulas

Let's now practice two ways of entering formulas: by typing and by pointing to cells.

Typing a Formula

The first formula you'll enter computes a 30% margin over the base cost of power windows.

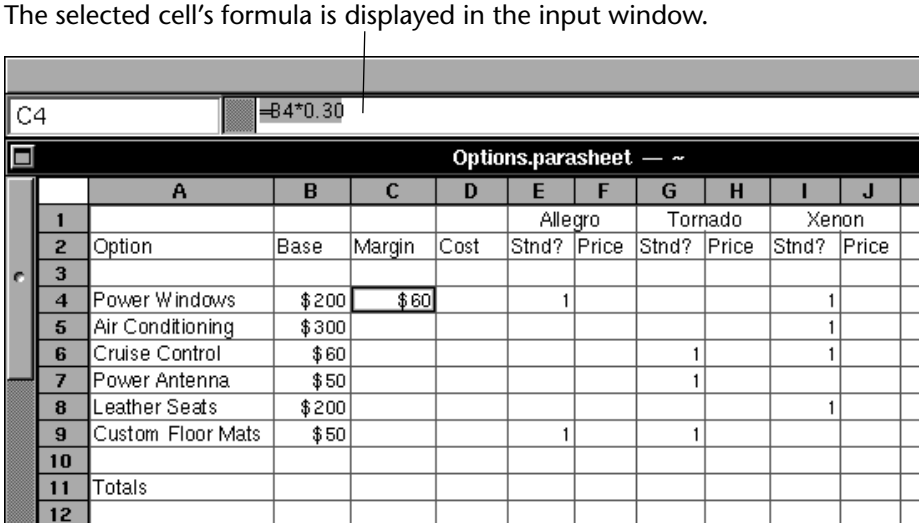
1. Select cell C4.

2. Type "=" to begin the formula.

3. Type "B4*30%" and press Enter.

The figure $60 appears in cell C4, but the formula you typed still appears in the input window, as shown below.

The selected cell's formula is displayed in the input window.



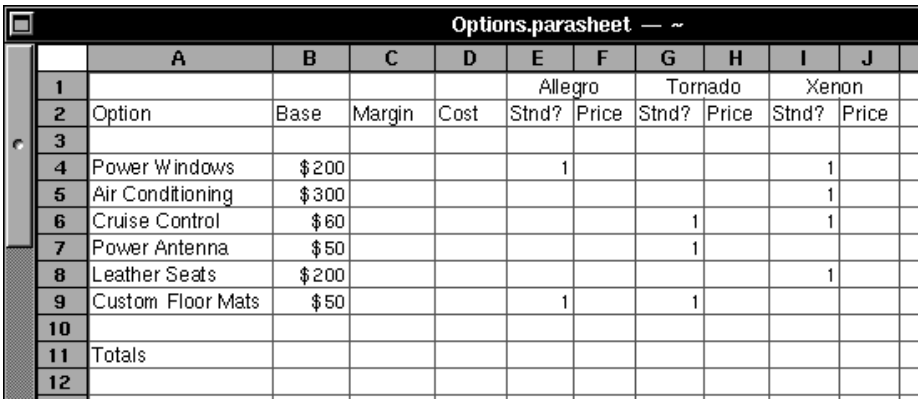
	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200	$60		1				1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals									
12										

You could have computed the same result by entering *=200*30%*, but you included the cell reference, B4, instead. Using the cell reference means that even if you change the value in B4, the formula still works. Another advantage to a cell reference is that you'll be able to copy this formula later to the cells below to compute the margin for each option.

Note *The cells in the Options spreadsheet that contain dollar values have been formatted to display their contents as currency. You'll learn how to change cell formats in the Advanced chapter of the Tutorial.*

3. Find the document titled *Options.parasheet* and double click to open it.

The spreadsheet that appears should look like this:



Options.parasheet — ~

	A	B	C	D	E	F	G	H	I	J
1					Allegro		Tornado		Xenon	
2	Option	Base	Margin	Cost	Stnd?	Price	Stnd?	Price	Stnd?	Price
3										
4	Power Windows	$200			1				1	
5	Air Conditioning	$300							1	
6	Cruise Control	$60					1		1	
7	Power Antenna	$50					1			
8	Leather Seats	$200							1	
9	Custom Floor Mats	$50			1		1			
10										
11	Totals									
12										

In this chapter, you'll decide which options should be standard on the new car you're marketing. You'll base your decision on the number of options included with competitive automobiles (indicated by the 1s in the *Stnd?* columns) and on the total cost of the options.

What Is a Formula?

Formulas provide you with an easy way to do calculations. They usually contain numbers, mathematical operators, and references to other cells.

All formulas begin with either = (equal sign), - (minus sign), or + (plus sign). The last two formulas in the table below contain *functions*. Each function performs a specific operation on cell values. For instance, the *Avg* function in the table below finds the average of the values in cells A5 through E5.

Formula	Result
=C3/F8	Divides the value in C3 by the value in F8
+H24*0.1	Multiplies the value in cell H24 by the constant value 0.1
-5+7	Adds seven to negative 5
=Sum(B2:B6)	Totals the values in cells B2, B3, B4, B5, and B6
=Avg(A5:E5)	Finds the average of the values in cells A5, B5, C5, D5, and E5

Chapter 2

Intermediate

This chapter builds on what you learned in Chapter 1. Here you'll learn different ways to create formulas, how to use the Function panel, and you'll learn the difference between relative and absolute cell references.

Working with Formulas

1. If ParaSheet isn't already running, find its icon and double-click it.

2. Choose the *Samples* command from ParaSheet's Info menu.

This will raise a panel in the Workspace showing all of ParaSheet's sample documents.