

10b Spreadsheets 2 – Calculations

Depending upon what you will be doing in your spreadsheets you may not frequently use the contents of this exercise but it is a good exercise towards better understanding your computer.

However, it is best to be familiar with the concepts as you may otherwise create problems for yourself.

Symbols – the equals symbol

From exercise 1 you will be familiar with the addition symbol "+" and the result symbol "=". Thus

$$2 + 3 = 5$$

However, this is written differently for the formula for a cell. Assuming we are putting in the calculation for cell C3 we would write

$$= 2 + 3$$

This should be read as

$$\text{the value of C3} = 2 + 3$$

Of course, in most instances we will be putting in references to the contents of other cells rather than specific numbers. For example:

$$\text{the value of C3} = \text{the contents of C1} + \text{the contents of C2, i.e. C1+C2}$$

	A	B	C	D	E
1					
2					
3					
4					
5					

Other symbols

Subtraction : this is the symbol "-" and works in the same manner as "+"

Multiplication : this uses the symbol "*" and NOT "x"

Division : this uses the symbol "/".

Exponentiation : this uses the symbol "^", for example $3^2 = 9$

The other symbols you should know are parentheses "(" and ")". These are used to control the sequence in which a calculation is done – you will see examples later.

Multiplication – Example 1

- Cell C4 contains the number of units sold, say 50
- Cell D4 contains the selling price per unit, say R9.50. Remember we use "." not "," for decimals
- Cell E4 will contain the selling price

	A	B	C	D	E
1					
2					
3			Units Sold	Selling price per unit	Selling Price
4			50	9.50	475.00
5					
6					
7					

Then in Cell E4 we would enter

$$=C4*D4 \text{ which will calculate } 50 * 9.50, \text{ i.e. R475.00}$$

Multiplication – Example 2

	A	B	C	D	E	F	G
1							
2							
3			Units Sold	Selling price per unit	Weight per unit	Shipping cost per kg	Selling Price
4			50	9.50	0.50	4.75	593.75
5							

As above but let's add a shipping cost.

Cell E4 contains the weight in kg per unit, say 0.5

Cell F4 contains the shipping cost per kg, say R4.75

Then the shipping cost will be $C4 * E4 * F4$, number of units * weight per unit * shipping per kg

Then the total selling price will be $= C4 * D4 + C4 * E4 * F4$

This leads us to the most important point of this exercise. A computer will never "understand" what you intend. It will always work according to its instructions and you must ensure that the instructions you are giving it are clear and what you intend.

If the computer follows the instructions left to right it would do the following

Multiple C4 and D4

Add C4

Multiple this total by E4 and then F4

This is certainly not what we intended. In this case we are saved by the arithmetic rules of precedent that the spreadsheet is programmed to follow. This is

calculate any exponentiation

calculate any multiplication and division moving left to right

calculate any addition and subtraction.

In our example, there is no exponentiation so the sequence is

multiple C4 and D4 giving result 1 so we now have : Result 1 + C4 * E4 * F4

multiple C4 and E4 giving Result 2 so we now have : Result 1 + Result 2 * F4

multiple Result 2 and F4 giving Result 3 so we now have : Result 1 + Result 3

add Result 1 and Result 3

We are very fortunate that this is what we intended. Even if you are very certain the calculation does what you intend this may not be obvious to someone who receives it from you. Rather use parentheses to ensure the sequence of calculation is exactly what you intend.

	A	B	C	D	E	F	G
1							
2							
3			Units Sold	Selling price per unit	Weight per unit	Shipping cost per kg	Selling Price
4			50	9.50	0.50	4.75	593.75
5							
6							

So we can write

$$(C4*D4)+(C4*E4*F4)$$

It is now very clear what we intend. If necessary we can use multiple levels of parentheses to obtain the calculation we require.