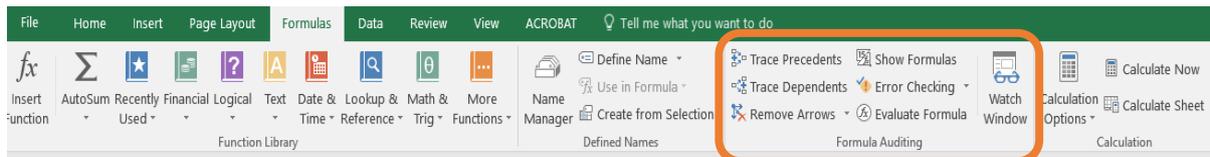


# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

### Accessing Auditing Tools

Formulas > Formula Auditing group



**Trace Precedents** ... select a cell to which you would like to see what cells lead onto this one. So, for example, a basic calculation of =F8+K28 within cell R55 if this cell R55 is selected - one click of Trace Precedents would provide arrows from R55 to both F8 and K28. If cell K28 had a calculation, another click of the button would lead to any cells being precedent to this cell, and so on.

**Trace Dependents** ... the opposite to the above Trace Precedents. It traces and shows with arrows any cells reliant upon the selected cell. As above, another click would lead onto any dependents of the next set of dependents.

Trace Precedents of cell G9 in this example below. (Selected cell G9, one click Trace Precedents):

	A	B	C	D	E	F	G	H	I
1	<b>Commission Calculations for Business Development Manager</b>								
2									
3									
4	<b>Month</b>	<b>Sea</b>	<b>Air</b>	<b>Land</b>	<b>TOTAL</b>	<b>Average Sales</b>	<b>Percentage of Sales</b>	<b>Target Achievement</b>	<b>Commission</b>
5	January	550.00	625.00	1,780.00	2,955.00	985.00	#VALUE!	Below Target	#VALUE!
6	February	1,200.00	1,500.00	4,870.00	7,570.00	2,523.33	#VALUE!	Good Total	1,665
7	March	780.00	1,250.00	4,210.00	6,240.00	2,080.00	#VALUE!	Good Total	1,373
8	April	650.00	1,250.00	4,750.00	6,650.00	2,216.67	#VALUE!	Good Total	1,463
9	May	780.00	nil	3,120.00	#VALUE!	1,950.00	#VALUE!	#VALUE!	#VALUE!
10	June	1,250.00	1,100.00	5,890.00	8,240.00	2,746.67	#VALUE!	Good Total	1,813
11	July	980.00	780.00	2,885.00	4,645.00	1,548.33	#VALUE!	Below Target	139
12	August	350.00	1,200.00	2,050.00	3,600.00	1,200.00	#VALUE!	Below Target	108
13	September	1220	2,240.00	4,760.00	8,220.00	2,740.00	#DIV/0!	Good Total	1,808
14	October	980.00	2,890.00	4,955.00	8,825.00	2,941.67	#VALUE!	Good Total	1,942
15	November	250.00	2,550.00	3,980.00	6,780.00	2,260.00	#VALUE!	Good Total	1,492
16	December	150.00	400.00	3,540.00	4,090.00	1,363.33	#VALUE!	Below Target	#VALUE!
17	<b>TOTAL</b>	9,140.00	15,785.00	46,790.00	#VALUE!		#VALUE!		#VALUE!
18									
19									
20	Target Sales								
21	Target Total:	5,000.00							
22									
23	Commision Values								
24	Above Target:	22%							
25	Under Target:	3%							

# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

Trace Precedents of cell G9 plus one more click to view next level back for precedents:

	A	B	C	D	E	F	G	H	I
1	<b>Commission Calculations for Business Development Manager</b>								
2									
3									
4	Month	Sea	Air	Land	TOTAL	Average Sales	Percentage of Sales	Target Achievement	Commission
5	January	550.00	625.00	1,780.00	2,955.00	985.00	#VALUE!	Below Target	#VALUE!
6	February	1,200.00	1,500.00	4,870.00	7,570.00	2,523.33	#VALUE!	Good Total	1,665
7	March	780.00	1,250.00	4,210.00	6,240.00	2,080.00	#VALUE!	Good Total	1,373
8	April	650.00	1,250.00	4,750.00	6,650.00	2,216.67	#VALUE!	Good Total	1,463
9	May	780.00	nil	3,120.00	#VALUE!	1,956.67	#VALUE!	#VALUE!	#VALUE!
10	June	1,250.00	1,100.00	5,890.00	8,240.00	2,746.67	#VALUE!	Good Total	1,813
11	July	980.00	780.00	2,885.00	4,645.00	1,548.33	#VALUE!	Below Target	139
12	August	350.00	1,200.00	2,050.00	3,600.00	1,200.00	#VALUE!	Below Target	108
13	September	1220	2,240.00	4,760.00	8,220.00	2,740.00	#DIV/0!	Good Total	1,808
14	October	980.00	2,890.00	4,955.00	8,825.00	2,941.67	#VALUE!	Good Total	1,942
15	November	250.00	2,550.00	3,980.00	6,780.00	2,260.00	#VALUE!	Good Total	1,492
16	December	150.00	400.00	3,540.00	4,090.00	1,363.33	#VALUE!	Below Target	#VALUE!
17	<b>TOTAL</b>	9,140.00	15,785.00	46,790.00	#VALUE!		#VALUE!		#VALUE!
18									
19									
20	Target Sales								
21	Target Total:	5,000.00							
22									
23	Commision Values								
24	Above Target:	22%							
25	Under Target:	3%							

Another click of the Trace Precedents provides arrows to the next level back, enabling a story of the spreadsheet based upon the selected cell to be built:

Month	Sea	Air	Land	TOTAL	Average Sales	Percentage of Sales
January	550.00	625.00	1,780.00	2,955.00	985.00	#VALUE!
February	1,200.00	1,500.00	4,870.00	7,570.00	2,523.33	#VALUE!
March	780.00	1,250.00	4,210.00	6,240.00	2,080.00	#VALUE!
April	650.00	1,250.00	4,750.00	6,650.00	2,216.67	#VALUE!
May	780.00	nil	3,120.00	#VALUE!	1,956.67	#VALUE!
June	1,250.00	1,100.00	5,890.00	8,240.00	2,746.67	#VALUE!
July	980.00	780.00	2,885.00	4,645.00	1,548.33	#VALUE!
August	350.00	1,200.00	2,050.00	3,600.00	1,200.00	#VALUE!
September	1220	2,240.00	4,760.00	8,220.00	2,740.00	#DIV/0!
October	980.00	2,890.00	4,955.00	8,825.00	2,941.67	#VALUE!
November	250.00	2,550.00	3,980.00	6,780.00	2,260.00	#VALUE!
December	150.00	400.00	3,540.00	4,090.00	1,363.33	#VALUE!
<b>TOTAL</b>	9,140.00	15,785.00	46,790.00	#VALUE!		#VALUE!

# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

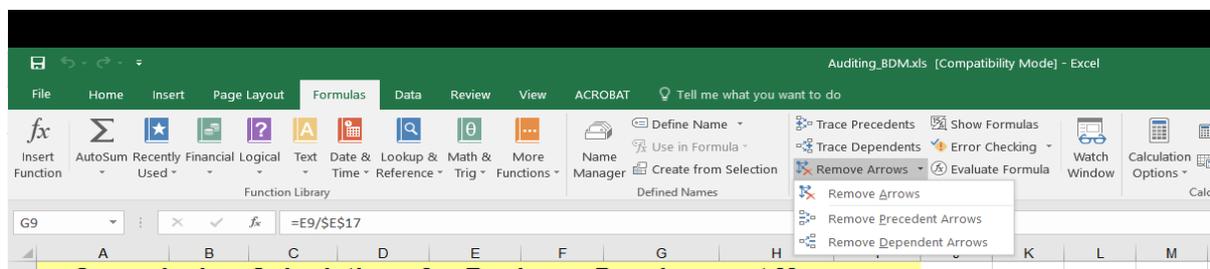
Trace Dependents, example shows the dependents of cell G9 at the first level (one click):

	A	B	C	D	E	F	G	H	I
1	<b>Commission Calculations for Business Development Manager</b>								
2									
3									
4	Month	Sea	Air	Land	TOTAL	Average Sales	Percentage of Sales	Target Achievement	Commission
5	January	550.00	625.00	1,780.00	2,955.00	985.00	#VALUE!	Below Target	#VALUE!
6	February	1,200.00	1,500.00	4,870.00	7,570.00	2,523.33	#VALUE!	Good Total	1,665
7	March	780.00	1,250.00	4,210.00	6,240.00	2,080.00	#VALUE!	Good Total	1,373
8	April	650.00	1,250.00	4,750.00	6,650.00	2,216.67	#VALUE!	Good Total	1,463
9	May	780.00	nil	3,120.00	#VALUE!	1,950.00	#VALUE!	#VALUE!	#VALUE!
10	June	1,250.00	1,100.00	5,890.00	8,240.00	2,746.67	#VALUE!	Good Total	1,813
11	July	980.00	780.00	2,885.00	4,645.00	1,548.33	#VALUE!	Below Target	139
12	August	350.00	1,200.00	2,050.00	3,600.00	1,200.00	#VALUE!	Below Target	108
13	September	1220	2,240.00	4,760.00	8,220.00	2,740.00	#DIV/0!	Good Total	1,808
14	October	980.00	2,890.00	4,955.00	8,825.00	2,941.67	#VALUE!	Good Total	1,942
15	November	250.00	2,550.00	3,980.00	6,780.00	2,260.00	#VALUE!	Good Total	1,492
16	December	150.00	400.00	3,540.00	4,090.00	1,363.33	#VALUE!	Below Target	#VALUE!
17	<b>TOTAL</b>	9,140.00	15,785.00	46,790.00	#VALUE!		#VALUE!		#VALUE!
18									
19									
20	Target Sales								
21	Target Total:	5,000.00							
22									
23	Commision Values								
24	Above Target:	22%							
25	Under Target:	3%							

The Trace Dependents is similar to the Trace Precedents, in the other direction of calculations.

Remove Arrows will remove all arrows at all levels in one click.

However, the drop down for Remove Arrows allows either Precedent or Dependent arrows to be removed at one level at a time by using these options:



Auditing tools offer more than understanding a spreadsheet and identifying what changes would affect other cells or how each calculation works with others. The auditing tools also offer error checking and evaluation of formulae, assisting the user to check over a spreadsheet.

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# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

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**Show Formulas** will display formulae as opposed to the default result of formulae within cells. It is an on / off switch by clicking again. This enables a user to scour through with their eye as to each cell calculations.

**Error Checking** tool allows a user to trace errors and to locate where errors might possibly be within a sheet. It can assist with help. Care should be taken, similar to the dictionary spellcheck, it does not mean something is definitely wrong, it only means it does not meet predefined rules set by Microsoft Corporation.

For example, a formula might be copied down a column, a different formula in the next cell and then a return to the same pattern as before. An error marking might appear to show the pattern is broken. This might be a mistake or it might be correct – Excel is just checking with the user to ensure it is correct, it is not saying it is wrong – just check.

The error checking tool:

250.00	4,750.00	6,650.00	2,216.67	#VALUE!	Good Total	1,463
	3,120.00	#VALUE!	1,950.00	#VALUE!	#VALUE!	#VALUE!
,100.00	5,890.00	8,240.00	2,746.67	#VALUE!	Good Total	1,813
780.00	2,885.00	4,645.00	1,548.33	#VALUE!	Below Target	139
200.00	2,050.00	3,600.00	1,200.00	#VALUE!	Below Target	108
240.00	4,760.00	8,220.00	2,740.00	#DIV/0!	Good Total	1,808
890.00	4,955.00	8,825.00	2,941.67	#VALUE!	Good Total	1,942

The screenshot shows the 'Error Checking' dialog box. The 'Error in cell' field contains 'G9' and the formula bar shows '=E9/\$E\$17'. The error message is 'Error in Value: A value used in the formula is of the wrong data type.' The dialog has several buttons: 'Help on this error' (highlighted with a red box), 'Trace Error', 'Ignore Error', 'Edit in Formula Bar', 'Options...', 'Previous', and 'Next'.

As you will note from the screenshot above, the user can ask for help on the error with the help facility providing more of a read for the specific error. The example shows an error in value with short explanation. The Trace Error will assist with working back the way and Ignore Error is for advising Excel it is not an error and is correct. The Edit in Formula Bar allows the user to jump up to the formula bar to edit as required. Next button will take you to the next error. Previous is self-explanatory. The options button allows the user to control how errors are announced.

# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

Another useful tool, other than just viewing formulae but needing to understand what is happening within a formula is the **Evaluate Formula**.

Evaluate Formula will take you step by step through a calculation to enable each step to be checked for correctness and to aid identification of where an error might be located.

For example:

The screenshot shows an Excel spreadsheet with the following data:

Month	Sea	Air	Land	TOTAL	Average Sales	Percentage of Sales	Target Achievement	Commission
January	550.00	625.00	1,780.00	2,955.00	985.00	#VALUE!	Below Target	#VALUE!
February	1,200.00	1,500.00	4,870.00	7,570.00	2,523.33	#VALUE!	Good Total	1,665
March	780.00	1,250.00	4,210.00	6,240.00	2,080.00	#VALUE!	Good Total	1,373
April	650.00	1,250.00	4,750.00	6,650.00	2,216.67	#VALUE!	Good Total	1,463
May	780.00	nil	3,120.00	#VALUE!	1,950.00	#VALUE!	#VALUE!	#VALUE!
June	1,250.00	1,100.00	5,890.00	8,240.00	2,746.67	#VALUE!	Good Total	1,813
July	980.00							
August	350.00							
September	1220							
October	980.00							
November	250.00							
December	150.00							
TOTAL	9,140.00							

The 'Evaluate Formula' dialog box is open, showing the reference 'BDM!\$G\$9' and the evaluation formula '= E9/\$E\$17'. The 'Evaluate' button is highlighted.

The Evaluate button would explain the current step:

The close-up screenshot shows the 'Evaluate Formula' dialog box with the following details:

- Reference: BDM!\$G\$9
- Evaluation: = #VALUE!/\$E\$17

The error message '#VALUE!/\$E\$17' is displayed in the evaluation field, indicating a value error in the formula.

The example shows a "value" error for the first part of the formula.

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# Spreadsheet Notes by Mark Gillan

## Auditing Tools and Error Checking

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**Error codes** worth knowing:

- #####** - Column is not wide enough to display content  
Possible solution: Increase the width of the column
  
- #NAME?** - Excel does not recognise text in a formula  
Possible solution: Correct the text or delete
  
- #VALUE!** - A formula has the incorrect type of argument, unable to calculate  
Possible solution: Alter content to a number or use a function to ignore text
  
- #REF!** - Formula refers to a cell reference that is not valid  
Possible solution: Check cell references, edit to correct and check again
  
- #DIV/0!** - Error when a formula attempts to divide a number by zero or blank cell  
Possible solution: Check the division, allow working of a valid calculation
  
- #NULL!** - Two or more cell references are separated by a space or incorrect input  
Possible solution: Ensure cell references correctly use appropriate operator

Microsoft Excel displays a small green triangle in the top left of a cell containing a possible error.

Auditing tools are useful for investigating errors but can also be used to determine the workings of a spreadsheet.

**Watch Window** can be used to keep an eye on any changes made to a cell. This can be handy when sharing a spreadsheet or just monitoring a cell for changes.