

You may want to check formulas for accuracy or find the source of an error. Excel Formula Auditing commands provide you an easy way to find

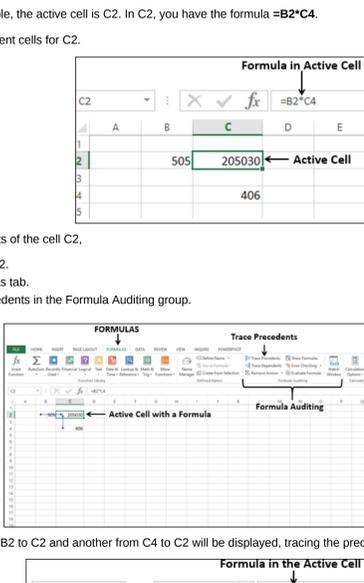
- Which cells are contributing in the calculation of a formula in the active cell.
- Which formulas are referring to the active cell.

These findings are shown graphically by arrow lines that makes the visualization easy. You can display all the formulas in the active worksheet with a single command. If your formulas refer to cells in a different workbook, open that workbook also. Excel cannot go to a cell in a workbook that is not open.

Setting the Display Options

You need to check whether the display options for the workbooks you are using are correctly set.

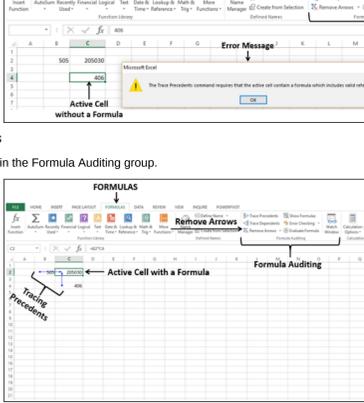
- Click **FILE > Options**.
- In the Excel Options dialog box, click **Advanced**.
- In **Display options for the workbook** –
 - Select the workbook.
 - Check that under **For objects, show**, **All** is selected.
- Repeat this step for all the workbooks you are auditing.



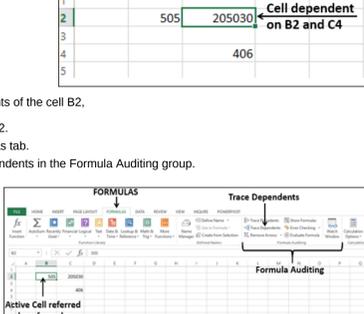
Tracing Precedents

Precedent cells are those cells that are referred to by a formula in the active cell.

In the following example, the active cell is C2. In C2, you have the formula $=B2 * C4$. B2 and C4 are precedent cells for C2.



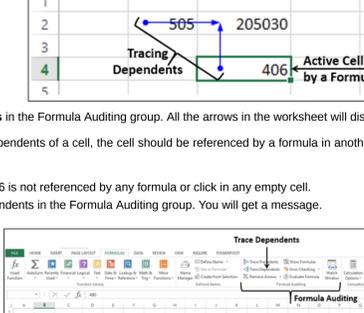
- To trace the precedents of the cell C2,
 - Click in the cell C2.
 - Click the **Formulas** tab.
 - Click **Trace Precedents** in the **Formula Auditing** group.



Note that for tracing precedents of a cell, the cell should have a formula with valid references. Otherwise, you will get an error message.

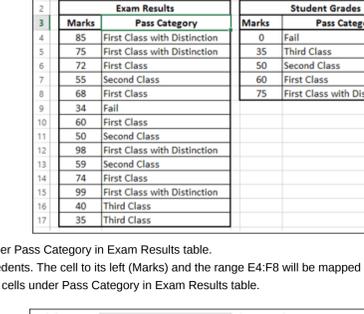
- Click in a cell that does not contain a formula or click in an empty cell.
- Click **Trace Precedents** in the **Formula Auditing** group.

You will get a message.



Removing Arrows

Click **Remove Arrows** in the **Formula Auditing** group.

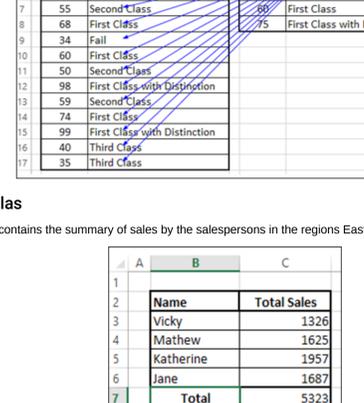


All the arrows in the worksheet will disappear.

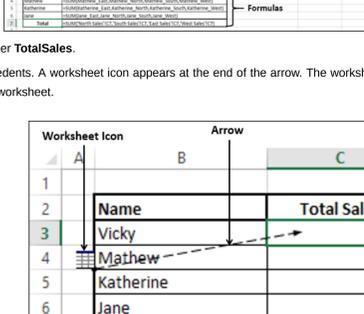
Tracing Dependents

Dependent cells contain formulas that refer to other cells. That means, if the active cell contributes to a formula in another cell, the other cell is a dependent cell on the active cell.

In the example below, C2 has the formula $=B2 * C4$. Therefore, C2 is a dependent cell on the cells B2 and C4



- To trace the dependents of the cell B2,
 - Click in the cell B2.
 - Click the **Formulas** tab.
 - Click **Trace Dependents** in the **Formula Auditing** group.

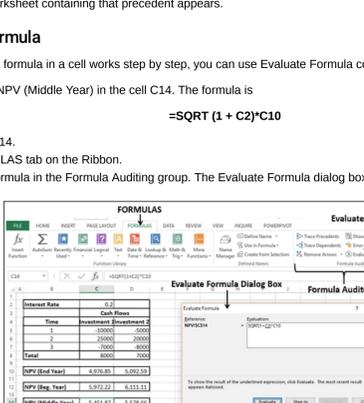


An arrow appears from B2 to C2, showing C2 is dependent on B2.

To trace the dependents of the cell C4 –

- Click in the cell C4.
- Click the **Formulas** tab > **Trace Dependents** in the **Formula Auditing** group.

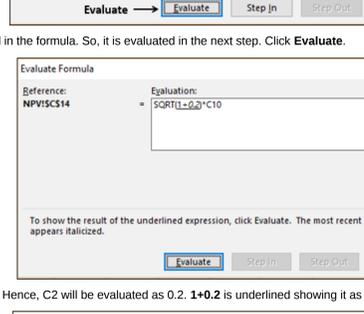
Another arrow appears from C4 to C2, showing C2 is dependent on C4 also.



Click **Remove Arrows** in the **Formula Auditing** group. All the arrows in the worksheet will disappear.

Note – For tracing dependents of a cell, the cell should be referenced by a formula in another cell. Otherwise, you will get an error message.

- Click in the cell B6
- Click **Trace Dependents** in the **Formula Auditing** group. You will get a message.

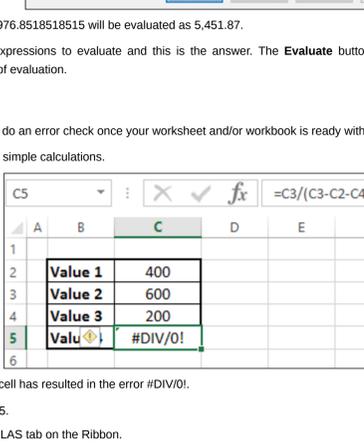


Working with Formulae

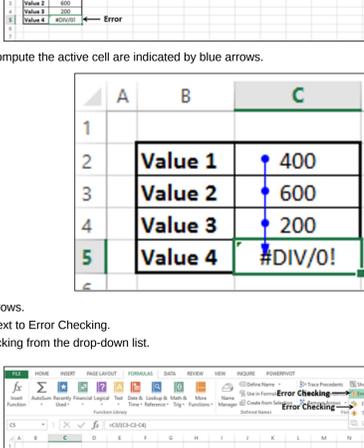
You have understood the concept of Precedents and Dependents. Now, consider a worksheet with several formulae.

Exam Results			Student Grades	
Marks	Pass Category	Marks	Pass Category	
85	First Class with Distinction	0	Fail	
75	First Class with Distinction	35	Third Class	
72	First Class with Distinction	50	Second Class	
55	Second Class	60	First Class	
68	First Class	75	First Class with Distinction	
34	Fail			
60	First Class			
50	Second Class			
98	First Class with Distinction			
59	Second Class			
74	First Class			
99	First Class with Distinction			
40	Third Class			
35	Third Class			

- Click in a cell under **Pass Category** in its Exam Results table.
- Click **Trace Precedents**. The cell to its left (Marks) and the range E4:F8 will be mapped as the precedents.
- Repeat for all the cells under **Pass Category** in Exam Results table.



- Click in a cell under **Pass Category** in Student Grades table.
- Click **Trace Dependents**. All the cells under **Pass Category** in Exam Results table will be mapped as the dependents.



Showing Formulas

The worksheet below contains the summary of sales by the salespersons in the regions East, North, South, and West.

Name	Total Sales
Vicky	1326
Mathew	1625
Katherine	1957
Jane	1687
Total	5323

- Click the **FORMULAS** tab on the Ribbon.
- Click **Show Formulas** in the **Formula Auditing** group. The Formulas in the worksheet will appear, so that you will know which cells contain formulas and what the formulas are.

- Click in a cell under **TotalSales**.
- Click **Trace Precedents**. A worksheet icon appears at the end of the arrow. The worksheet icon indicates that the precedents are in a different worksheet.

Double-click on the arrow. A **Go To** dialog box appears, showing the precedents.

As you observe, there are four precedents, on four different worksheets.

- Click a reference of one of the precedents.
- The reference appears in the **Reference** box.
- Click **OK**. The worksheet containing that precedent appears.

Evaluating a Formula

To find how a complex formula in a cell works step by step, you can use Evaluate Formula command.

Consider the formula NPV (Middle Year) in the cell C14. The formula is $=SQRT(1 + C2) * C10$

- Click in the cell C14.
- Click the **FORMULAS** tab on the Ribbon.
- Click **Evaluate Formula** in the **Formula Auditing** group. The **Evaluate Formula** dialog box appears.

In the **Evaluate Formula** dialog box, the formula is displayed in the box under **Evaluation**. By clicking the **Evaluate** button several times, the formula gets evaluated step-wise. The expression with an underline will always be executed next.

Here, C2 is underlined in the formula. So, it is evaluated in the next step. Click **Evaluate**.

Cell C2 has value 0.2. Hence, C2 will be evaluated as 0.2. $1+0.2$ is underlined showing it as the next step. Click **Evaluate**.

$1+0.2$ will be evaluated as 1.2. **SQRT(1.2)** is underlined showing it as next step. Click **Evaluate**.

SQRT(1.2) will be evaluated as 1.09544511501033. **C10** is underlined showing it as next step. Click **Evaluate**.

C10 will be evaluated as 4976.8518518515. **1.09544511501033*4976.8518518515** is underlined showing it as next step. Click **Evaluate**.

1.09544511501033*4976.8518518515 will be evaluated as 5,451.87.

There are no more expressions to evaluate and this is the answer. The **Evaluate** button will be changed to **Restart** button, indicating completion of evaluation.

Error Checking

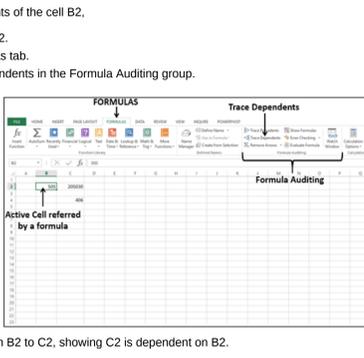
It is a good practice to do an error check once your worksheet and/or workbook is ready with calculations.

Consider the following simple calculations.

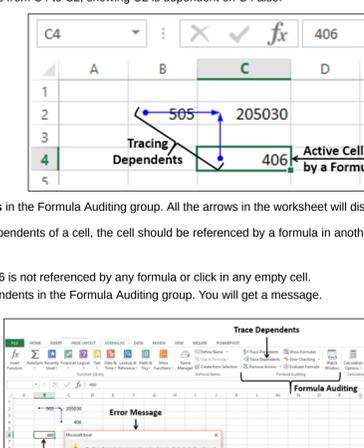
Value 1	Value 2	Value 3	Value 4
400	600	200	#DIV/0!

The calculation in the cell has resulted in the error #DIV/0!

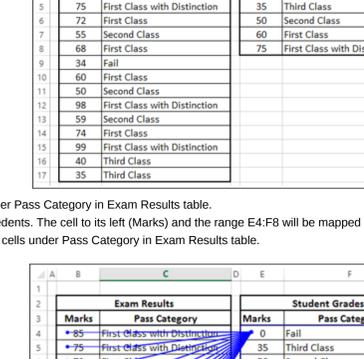
- Click in the cell C5.
- Click the **FORMULAS** tab on the Ribbon.
- Click the arrow next to **Error Checking** in the **Formula Auditing** group. In the drop-down list, you will find that **Circular References** is deactivated, indicating that your worksheet has no circular references.
- Select **Trace Error** from the drop-down list.



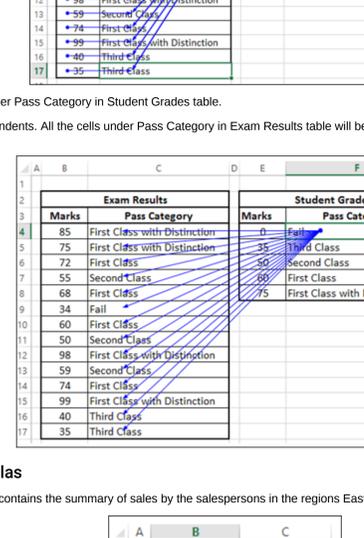
The cells needed to compute the active cell are indicated by blue arrows.



- Click **Remove Arrows**.
- Click the arrow next to **Error Checking**.
- Select **Error Checking** from the drop-down list.



The **Error Checking** dialog box appears.



Observe the following –

- If you click **Help on this error**, Help on the error will be displayed.
- If you click **Show Calculation Steps**, Evaluate Formula dialog box appears.
- If you click **Ignore Error**, the **Error Checking** dialog box closes and if you click **Error Checking** command again, it ignores this error.
- If you click **Edit in Formula Bar**, you will be taken to the formula in the formula bar, so that you can edit the formula in the cell.