

RedCrab

The Calculator

Version 4.46 News

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Version 4.46 news

1.18 Define a Function

In *RedCrab* you can define your own functions. The function definition begins with the name on the left, like a definition of a variable. The function symbol and the formal parameter list are in the middle, and the expression is on the right.

Example:

$$P = f(x, y) = \sqrt{x^2 + y^2}$$

The example below shows how to call a function that returns the result of an expression. A call of a self-defined function must be marked with the function symbol left of the function name.

$$P = f(x, y) = \sqrt{x^2 + y^2}$$

$$fP(3, 4) = 5$$

$$fP(a, b) = 10$$

$$a = 6 \quad b = 8$$

The arguments can be values, variable names, another function or any expressions.

$$P = f(x, y) = \sqrt{x^2 + y^2}$$

$$fP\left(\frac{144}{a*4}, ft(4)\right) = 10$$

$$a = 6 \quad t = f(x) = 2 * x$$

1.18.1 Scope of Function Parameters

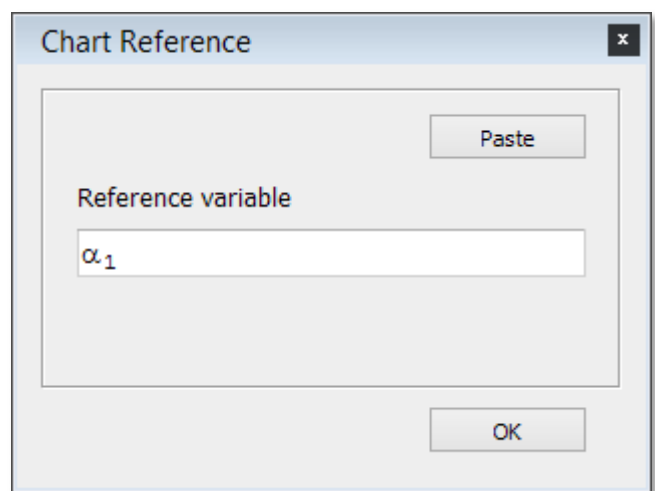
The variables, defined as formal parameter, have own scope inside the function. They can be referenced in the function only and not outside their function. It is allowed and makes no difference, if the same names in the argument list are defined and used elsewhere in the worksheet.

Inside the function you can use in addition to the parameter all other variables, which are defined elsewhere in the worksheet.

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13.7.1.1 Reference

The **Reference** menu item opens a dialog window to enter the reference variable. This variable contains the data field which is displayed graphically in the **Chart Box**. You can insert the name by **Paste** button or key board. Please note that the keyboard provides the **ANSI** char set only. Names, which includes Greek chars or sub mode characters must be inserted by the **Paste** button. For this, select the name in the work sheet and then click the Paste button in the dialog box. The name will display in the reference line.

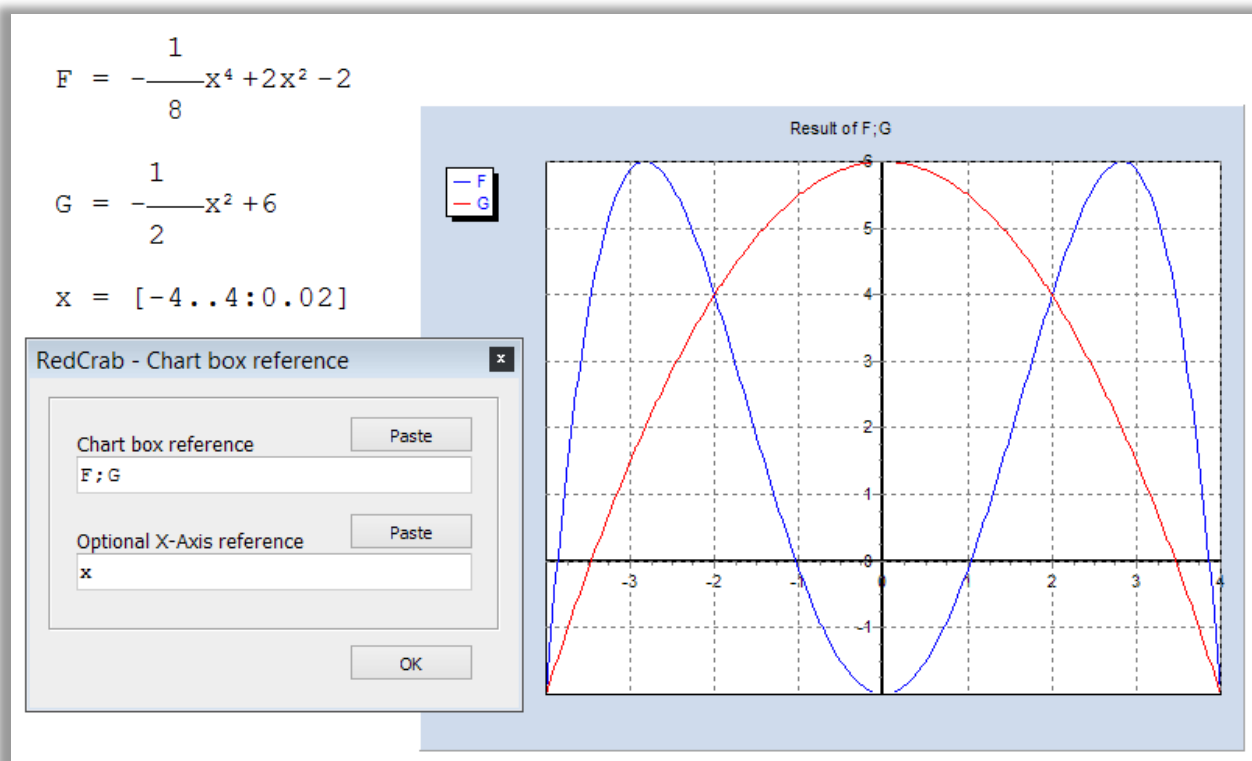


13.7.1.2 Optional X Axis References

By default, the X axis of line and bar diagrams starts left with the zero point on the scale and ascend to the maximum value on the right. The maximum value is the reference variable's number of elements.

The reference dialog window of **RedCrab^{PLUS}** has a second row for an optional X axis reference variable. This variable contains the scale of the X axis. The number of field elements must be identical with field numbers of the Y reference.

The picture below shows an example plot with the reference variable F and G. The X-axis reference is the variable x. This variable contains the values from -4 to +4



and is also the parameter in the two formulas above.

13.7.4 Settings

The menu item *Settings* include the following submenus

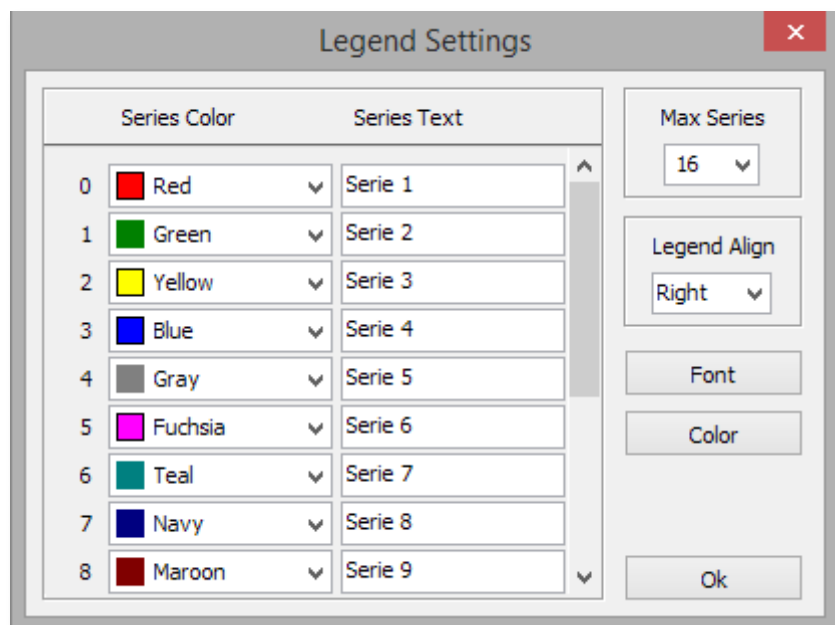
- Legend Settings sets:
 - o Series text and colour
 - o Legend position
 - o Legend font and colour
- Axes for setting of:
 - o Axis positions
 - o Axis properties

13.7.5 Series

In *RedCrab* 16 different colours for drawing of series are presented. If you use more than 16 series in a chart, beginning with series 17, the colours will repeat. The series name is displayed with the word *Serie* and a current number.

To change the series colours, series text and legend design, the menu *Settings* opens a dialog window. The dialog window contains 16 combo boxes to change the series colours and 16 editor boxes to assign the series name. If you need more than 16 series you can extend the list with the combo box Max Series.

! Max Series does not limited the number of series of a chart box, it only specify the length of the list. If Max Series is set to 16, and you use 20 series in the chart box, RedCrab uses for series 1 to 16, the dialog box colours and text. The series 17 to 20 uses the preset



colour and the name *Serie* with a current number.

13.7.5.1 Legend

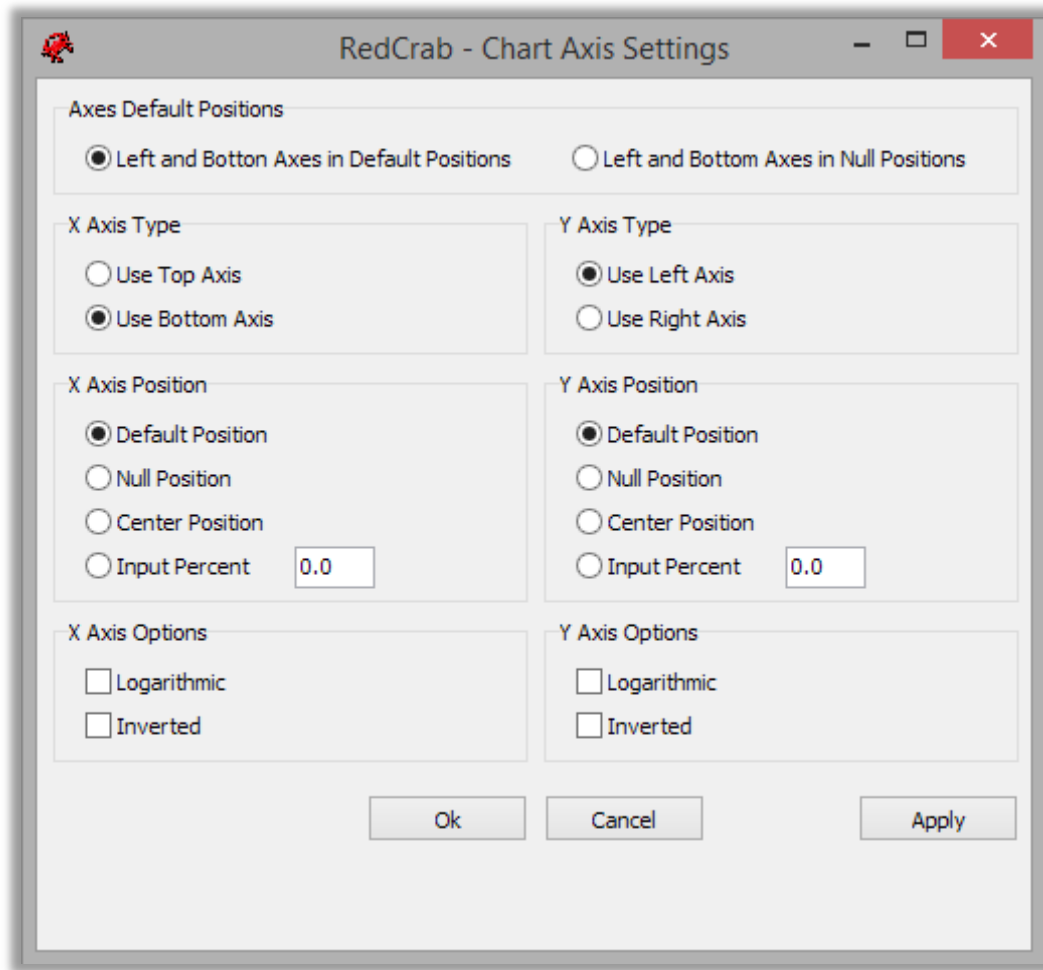
The legend is displayed right to the series. With the combo box *Legend Align* you can set the legend to left, right, top and bottom. The buttons *Font* and *Color* open dialog windows to change the legends font settings and the background colour.

13.7.6 Axes

A mouse click on the menu item Axes opens a dialog window for input of the axes properties. By default setting the Y axis ***Left*** displays always left from the chart and the X axis ***Bottom*** display at the bottom of the chart.

In addition, they are the axes ***Top*** and ***Right*** available, indicating the default positions top and right. The settings provide that the axes can placed in all positions. Please note that the axis ***Left*** show the scale left of the axis, ***Right*** shows the scale on the right side. The scale of ***Top*** is over and the scale of ***Bottom*** in under the axis.

The following picture shows the axes dialog window. The description of this is as below.



13.7.6.1 Axes Default Position

This frame contains two buttons for easy setting of the most commonly used positions.

Left and Bottom Axes in Default Positions resets all settings and displays the axes in the default positions left and bottom.

Left and Bottom Axes in Null Positions put the axes on the scale Null positions. In the frames ***X Axis Position*** and ***Y Axis Position*** are the ***Null Position*** buttons enabled. The settings of ***Axis Type*** and ***Axis Options*** remain unchanged.

13.7.6 .2 Axes Type

The *X-Axis Type* frame contains the *Top Axis* and the *Bottom Axis* buttons. The *Top Axis* default position is over the graphic and the *Bottom Axis* default position is under the graphic. In the *X-Axis Position* frame, you can set both axes on any position. Please note that the scale of *Top* is over and the scale of *Bottom* is under the axis.

The *Y-Axis Type* frame contains the *Left Axis* and the *Right Axis* buttons. The *Left Axis* default position is left of the graphic and the *Right Axis* default position is right of the graphic. In the *Y-Axis Position* frame, you can set both axes on any position. Please note that the axis *Left* shows the scale left of the axis, *Right* shows the scale on the right of the axis.

13.7.6.3 Axes Position

The *Axis Position* frames contain items for the position settings. You can set the most commonly used positions *Default*, *Null* and *Centre* with one mouse click. In addition, *Input Percent* provides any position between 0 and 100%.

X Axis Position

- The *Default Position* is, see the description above, over or under the graphic, according to the *Axis Type*. This is equal to 0% by *Input Percent*.
- *Null Position* set the *X* axis to the *Y* scale's Null position.
- *Center Position* sets the *X* axis in the centre of the *Y* axis. This is equal to 50% by *Input Percent*.
- With *Input Percent* you can set the *X* axis of any vertical positions. For *Bottom Axis*, 0% is the default position under the graphic and 100% the highest position on the top. For *Top Axis*, 0% is the default position over the graphic and 100% the bottom position.

Y Axis Position

- The **Default Position** is, see the description above, left or right of the graphic, according to the **Axis Type**. This is equal to 0% by **Input Percent**.
- **Null Position** set the Y axis to the X scale's Null position.
- **Center Position** sets the Y axis in the centre of the X axis. This is equal to 50% by **Input Percent**.
- With **Input Percent** you can set the Y axis of any horizontal positions. For **Left Axis**, 0% is the default position on the left and 100% is the maximum position on the right. For **Right Axis**, 0% is the default position on the right and 100% the position on the left.

13.7.6.4 Axes Options

- **Logarithmic**: the axes values increase logarithmic instead linear.
- **Inverted**: the axes scales are displayed inverted. The values of the X axis increase from right to left instead from left to right. The values of the Y axis increase from top to bottom instead from bottom to top.

13.7.7 Chart Zoom

The menu item **Chart Zoom** switched the Chart Box in Zoom Mode. To obtain zoom, hold the left mouse button and drag mouse toward down/right. You'll see a rectangle around the selected area. Release the left mouse button to zoom. To restore the zoom, drag a rectangle in the opposite direction (up/left).

You can move the zoomed graphic in the window with the mouse, if you hold the right mouse button.

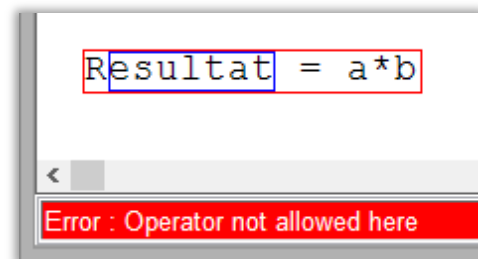
In Zoom mode, the popup menu is disabled and you can't move the Chart Box. Leave the Zoom mode with a double click on the Chart Box.

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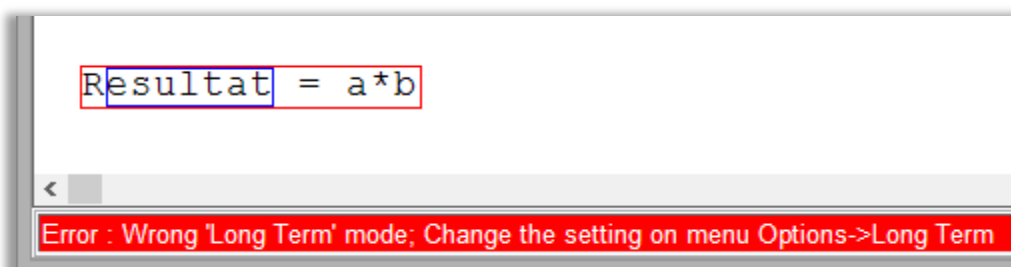
! Pay attention to the correct *Long Term* setting in the *Option* menu. An incorrect setting can cause confusing or misunderstandable error messages.

Read the description menu: *Options -> Long Term* below

Example: Regarding the implemented multiplication, in disabled *Long Term* mode, *RedCrab* interprets the expression *Resultat=a*b* as *R*e*s*u*l*t*a*t = a*b* and displays an error message like the example on the right.



As of version 4.44 the error message system is improved, it checks wrong user settings and display an error message like the example below.



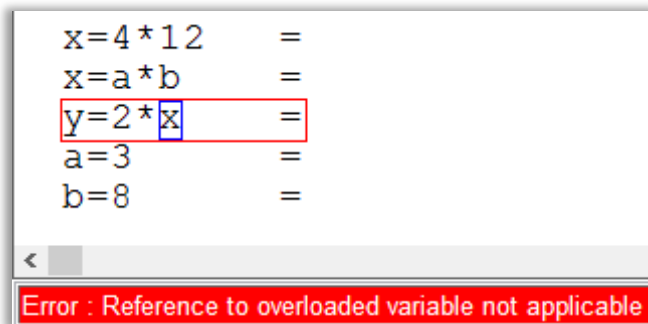
A wrong user setting is not accurate to identify, if there are several errors in the worksheet.

1.17 Calculate Selected Formulas

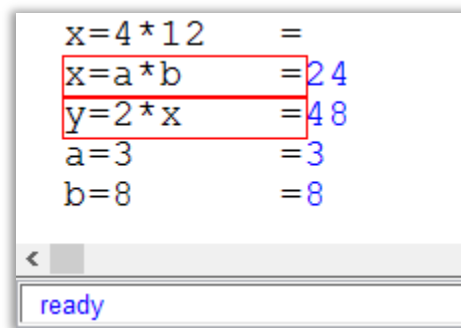
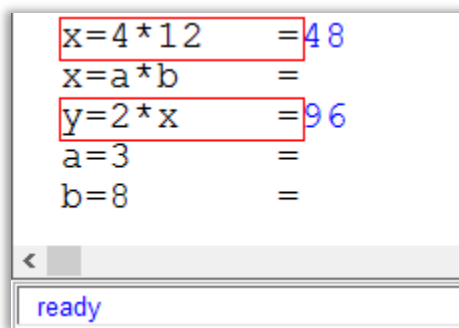
On worksheets which contain a collection of formulas, you can select one or more of them. The following calculation considers the selected formulas only. This can be useful when a worksheet contains different formulas for the same result.

Select the formulas with a click of the right mouse button. The selected formulas are marked with a red frame.

The example on the right shows an error message because the reference variable x has two different definitions.



In the examples below, the variable y is calculated with one of the values of x , controlled by the selection.



The selection is available for the imminent calculation and will be reset when the calculation terminates.

Result boxes work with selected formulas as well. When in the example above the variable x has a reference to a result box, the result box displays the result of the selected formula.

When a slider is inserted in the worksheet, the slider works only imminently after a calculation which was executed with the ***Enter*** key or button. After a change on the worksheet, the selection is invalid.

Tutor video: http://www.redchillicrab.com/en/redcrab/tutor/selected_range.html