Main Menu

Function

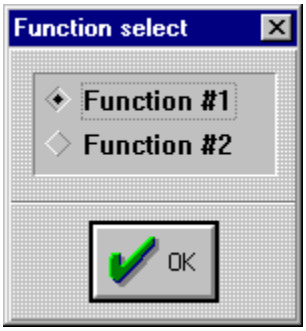
- **Define Function**
- **Evaluate f(x,y)**
- **Function Graph**
- **Function Select**
- **Save Functions**

Numerical Methods

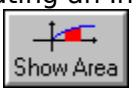
- **Interpolation**
- **Approximation**
- **Integration**
- **Differential Equation**
- **About...**
- **Exit**
- **Hints!**

Function Select

-> You can work with two functions. With de dialog-box below, define which function you are going to work with.



Hints!

- You can export a graph to any other Windows application - such as a text processor or an image editing software - clicking the system menu  of the graph window and choosing **Copy to clipboard**. Then go to the other Windows application and paste the graph pressing CTRL+V or choosing the menu Edit->Paste. Before to copy you can also change the background color of the graph.
- After entering the points to perform an Interpolation or an Approximation you can view the result function graph clicking the button  . Then if you select "View entry data points" you can drag the points for changing their positions and the last action performed (Interpolation or Approximation) will be redone automatically.
- With the system menu  of the cursor window you can change the scale and the quality of the graph without having to close it. You can also choose how many decimal places do you want the cursor position window to show.
- After calculating an Integration you can view the area you chose to calculated clicking the button 

- You can view two function graphs at the same time. After defining the function #1 select the function #2 using the menu Function->Function Select. Then define the function #2. After it click the button  , select the other function using the menu Function->Function Select, and then click the button  again. The graph windows will be place side by side automatically.

Help file main page

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Define Function

-> You can define a function with the mouse or with the keyboard.

-> If there is no defined function, some menu items are disabled: **Evaluate f(x,y)**, **Function Graph**, Interpolation **Using the entry function** to define the data points, **Integration**, **Differential Equation** and **Save Functions**.

-> While defining a function a lexicon error or a sintax error can occur.

-> **See also:** Functions examples
Selecting the function to work

Evaluate f(x,y)

-> **Evaluate f(x,y)** is disabled when there is no defined function.
See also **Define Function**

-> To evaluate the f(x,y) of the defined function, fill the x and/or y fields and click OK.

-> The f(x,y) value will be showed on the bottom of the dialog-box.

-> During f(x,y) evaluation the following errors can occur:

- Division by zero
- Power function domain error
- Log function domain error
- Ln function domain error
- Sqr function domain error
- Overflow

-> You can change the x and/or y values and click OK as many f(x,y) as you want to evaluate.

-> To close this dialog box click CANCEL.

-> **See also:** Selecting the function to work

f(x,y) =

-> When you enter a wrong x and/or y value, **VisualMethodos** shows an error message asking you for correcting the value(s).

It occured a division by zero during the f(x,y) evaluation.

Being *a****b* , it occured a power function domain error when:

- *a* is less than zero and *b* is fractional.
- *a* is equal to zero and *b* is less than or equal to zero

You tried to calculate a base 10 logarithm from a value less than or equal to zero.

You tried to calculate a natural logarithm from a value less than or equal to zero.

You tried to calculate a square root from a value less than zero.

The result is greater than 1.7*10**308 (absolute value)

Function Graph

-> **Function Graph** is disabled when there is no defined function.
See also **Define Function**

-> First is necessary to inform the scale and the quality.
-> Click OK and the function will be graphed.

-> If View entry data points is checked, the last entry data points will be shown (if there is entry data points).

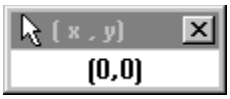
-> You can maximize, move or change the size of the function graph window.

-> The function graph has two dimensions, so, if the function has a y variable, its value will be zero.

-> You can work with the function graph window opened, in order of comparing with another function graph.

-> Accessing the system menu of the function graph window, you can change the background color. You can also copy the function graph to clipboard, to paste in another Windows application.

-> **See also:** Selecting the function to work
Cursor position

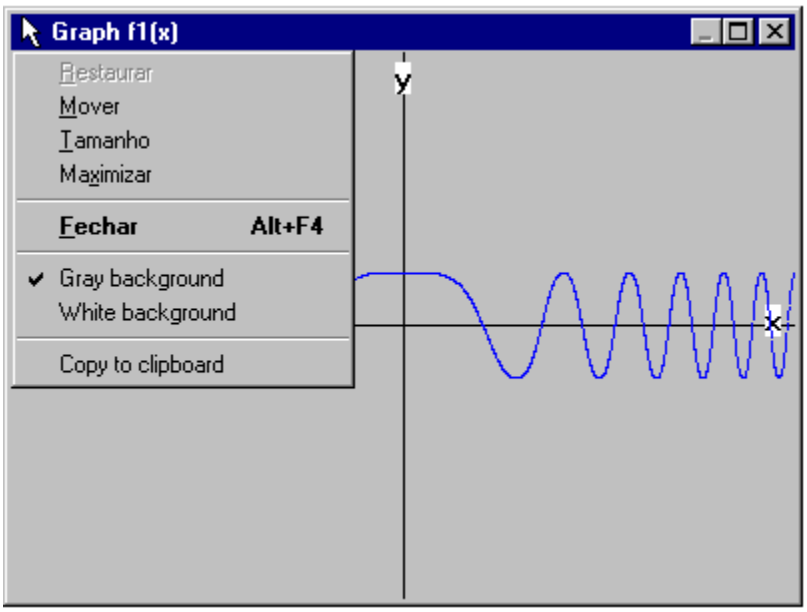


-> Whenever you are visualizing a function graph, entering points with mouse clicks, or visualizing the result area, a window shows the cursor position.

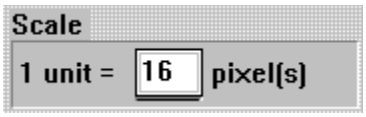
-> With the system menu you can:

- MOVE the window
- Chage its SIZE. This can be useful to visualize large coordinates, when the scale is too small
- CLOSE the cursor position window
- Visualize the cursor position with ONE DECIMAL PLACE, TWO DECIMALS PLACES or NO DECIMAL POINT
- Change the function graph SCALE/QUALITY

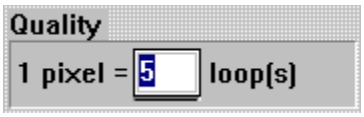

(x , y)
Mover
Tamanho
Fechar
Alt+F4
No decimal point
One decimal place
Two decimals places
Scale/Quality


Graph f1(x)
Restaurar
Mover
Tamanho
Maximizar
Fechar Alt+F4
Gray background
White background
Copy to clipboard
y
x


View entry data points



-> The function graph scale is the number of pixels per unit (default = 16).



-> The function graph quality determines the number of loops per pixel (default = 5).

-> For some function graphs, it should be necessary increase this value.

Interpolation

-> There are 3 ways of performing a **numerical interpolation** using **VisualMethodos**:

- **Using the entry function** to provide the data points
- **Using the keyboard**
- **Using the mouse**. 

Using the mouse

-> You must enter the number of points. You can use the last entry points of a specific function (if there is entry points).

-> For the interpolation, it will be used the points provided with mouse clicks.

-> Close the window when you finish clicking the points.

-> **VisualMethodos** tells then the polynomial interpolation degree, the polynomial found using Newton interpolation and the simplified polynomial.
-> You click OK and the given polynomial will be the defined function.
If you don't want to change the defined function hit CANCEL.

-> **See also** **Interpolation using the entry function**
Interpolation using the keyboard
Cursor position

Using the entry data points, **VisualMethodos** finds a polynomial which passes over each one of the points.

Using the entry function

-> Interpolation **Using the entry function** is disabled when there is no defined function.
See also **Define Function**

-> You must enter the n value and the xo and xn values.

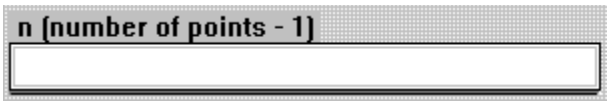
-> For the interpolation, it will be used n+1 points between xo and xn.

-> **VisualMethodos** tells then the polynomial interpolation degree, the polynomial found using Newton interpolation and the simplified polynomial.

-> You can click OK and the given polynomial will be the defined function.
If you don't want to change the defined function hit CANCEL.

-> **See also** **Interpolation using the keyboard**
Interpolation using the mouse
Cursor position

You can select something keeping the mouse left button pressed from the beginning to the end of which you wish to select.



-> The n value must be between 1 and 10.


x0
xn


Use the last entry points - f1(x)
Use the last entry points - f2(x)

Using the keyboard

-> You must enter the number of points. You can use the last entry points of a specific function (if there is entry points).

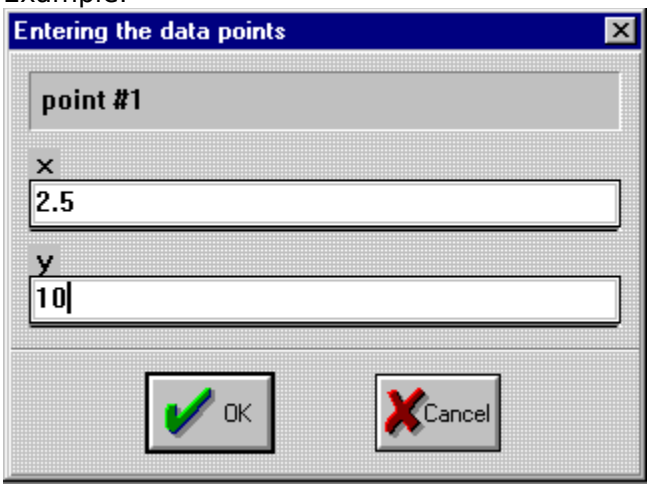
-> For the interpolation, it will be used the entry points, between xo and xn.
For each x value, VisualMethodos asks you for the correspondent y value.

-> **VisualMethodos** tells then the polynomial interpolation degree, the polynomial found using Newton interpolation and the simplified polynomial.

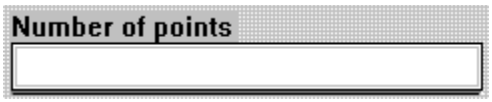
-> You can click and the given polynomial will be the defined function.
If you don't want to change the defined function hit CANCEL.

-> **See also** **Interpolation using the entry function**
Interpolation using the mouse

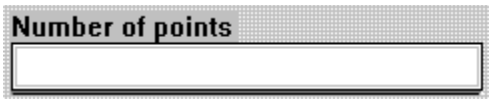
Example:



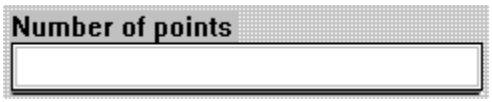
-> On this example, it point number 1 is entered: When x = 2.5, y = 10



-> The number of points must be between 2 and 11.



-> The number of points must be at least 2 and at most 260.



-> The number of points must be at least 3 and at most 260.

Approximation

-> **VisualMethodos** performes **approximation** to a **straight line**, to a **rational**, to a **parabola**, to an **exponential** and to a **power** function.

-> **VisualMethodos** also finds **what function the points most look like** 

Data points entered, **VisualMethodos** finds the function which most approximate (fit) to the these points.

What function the points most look like

-> You must enter the number of points. You can use the last entry points of a specific function (if there is entry points).

-> For the approximation, it will be used the entry points, between xo and xn.
For each x value, VisualMethodos asks you for the respective y value.

-> **VisualMethodos** shows what function, or functions, the entry points most look like.
-> You can click OK and the given polynomial will be the defined function.
If you don't want to change the defined function hit CANCEL.

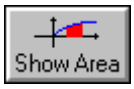
-> When occurs an error during the approximation to a function, it doesn't mean the data points don't fit to that function -- it means it was not possible to do the approximation for those specific points (usually when there are points with x coordinate less than or equal to zero, and it's need to evaluate their logarithm).

Integration

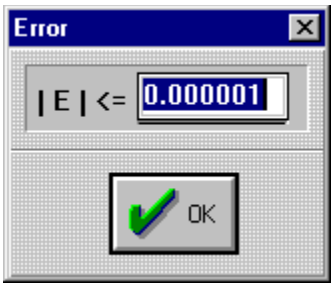
-> **Integration** is disabled if there is no defined function.
See also **Define Function**
-> To perform an **integration**, you must first enter the error you wish and click OK.

-> Then, you must enter the xo and xn values.

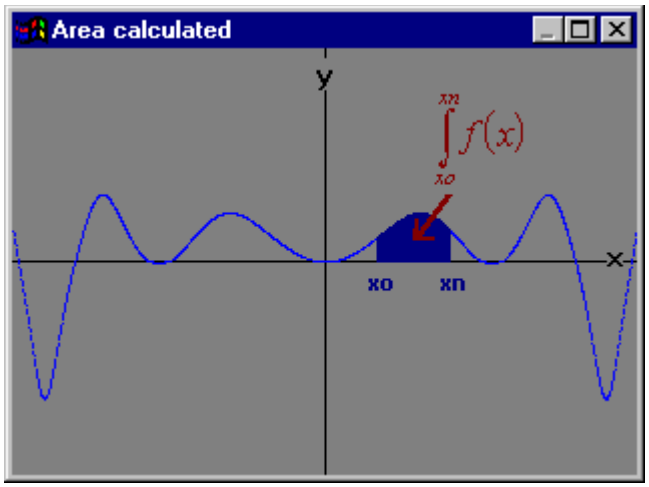
-> The number of steps and the integral value will be showed on the bottom of the dialog box.
-> You can change the xo and xn values and click OK as many f(x) integrals as you want to know.

-> To visualize the result area hit 

-> To close the **Integration** dialog box click CANCEL



-> The maximal error value (*the value found with Simpson integration* less *the exact integral value)*



-> Entered an interval [xo,xn] **VisualMethodos** finds the integral of a function in this interval.

Differential Equation

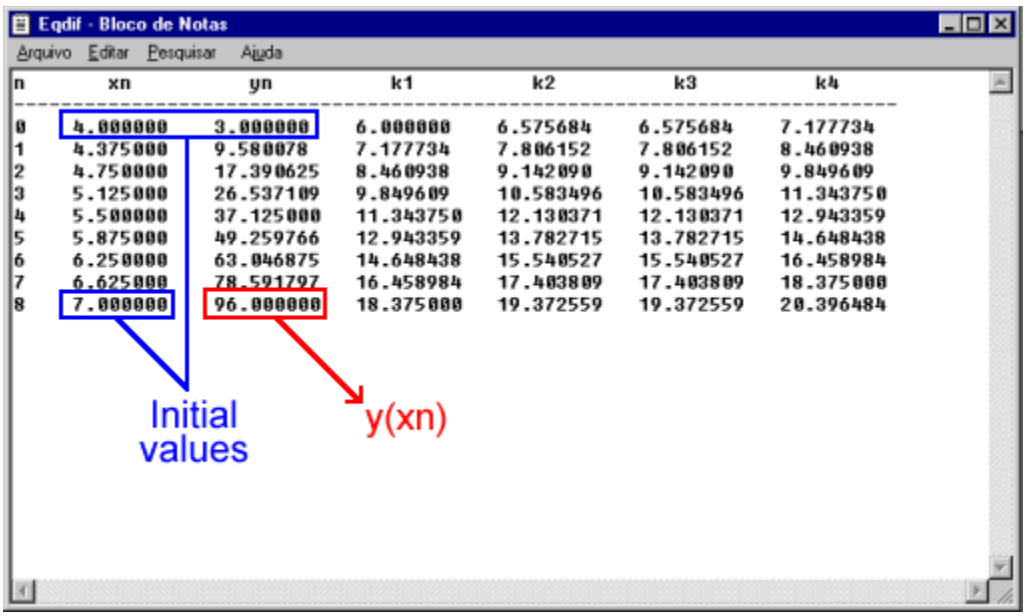
-> **Differential Equation** is disabled if there is no defined function.
See also **Define Function**
VisualMethodos uses the defined function as it was a y' (x).

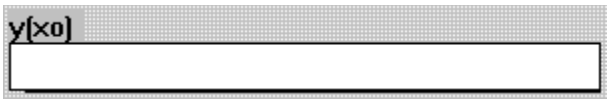
-> You must first to inform the error you wish and press OK.

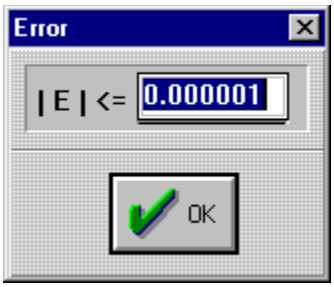
-> Then, you must inform the y(xo) value and the xo and xn values
-> Press OK and **VisualMethodos** will show the y(xn) value.

-> **VisualMethodos** creates an text-archive EQDIF.TXT and edits it on the Microsoft Notepad, so don't forget to close it.

Example:


Eqdif - Bloco de Notas
Arquivo Editar Pesquisar Ajuda
n xn yn k1 k2 k3 k4
0 4.000000 3.000000 6.000000 6.575684 6.575684 7.177734
1 4.375000 9.580078 7.177734 7.806152 7.806152 8.460938
2 4.750000 17.390625 8.460938 9.142090 9.142090 9.849609
3 5.125000 26.537109 9.849609 10.583496 10.583496 11.343750
4 5.500000 37.125000 11.343750 12.130371 12.130371 12.943359
5 5.875000 49.259766 12.943359 13.782715 13.782715 14.648438
6 6.250000 63.046875 14.648438 15.540527 15.540527 16.458984
7 6.625000 78.591797 16.458984 17.403809 17.403809 18.375000
8 7.000000 96.000000 18.375000 19.372559 19.372559 20.396484
Initial values
y(xn)


y(xo)



-> Maximal error value (*the value found with RK-4* less *the exact value)*

Save Functions

-> **Save Functions** is disabled if there is no defined function.
See also **Define Function**

-> **VisualMethodos** save the defined functions in the file VISMET.DEF.

Defining the funtion with the mouse

-> You can define the function clicking the buttons.
-> To clear the display click CLEAR
-> To accept the function click OK
-> To close the **Define Function** dialog box and ignore changes hit CANCEL.

-> **See also** Correcting a typing mistake
Valid operations
Lexicon error
Sintax error
Defining the function with the keyboard

Defining the function with the keyboard

-> When the **Define Function** dialog box is opened -- if there is already a defined function -- the function stays selected. If you type something the function will be cleared. To edit the function hit **Home** or **End**.
-> To clear the display press **Tab** until the button CLEAR is selected. Then, you must press **Enter**.

-> Type the function as you were typing something in a text editor.
-> When you have defined the function, press **Tab** until the button OK is selected. Then, you must press **Enter**.
-> To close the **Define Function** dialog box and ignore changes press **Esc**.

-> **See also** Correcting a typing mistake
Valid operations
Lexicon error
Sintax error
Defining the function with the mouse

Correcting a typing mistake

-> It's only possible to correct typing mistakes with the keyboard.

-> Click over the display

-> As the mouse will select the function, you must press, for example, **Home** or **End**.

-> Now, you must correct the function as you were using a text editor.

When some part of the function is *selected*, it stays with inverted colors

-> Not selected function: 

-> Selected function: 

Valid operations

-> Addition

-> Subtraction

-> Multiplication

-> Division

-> Raising to a given power

-> Square root

-> Sine

-> Cosine

-> Tangent

-> Base 10 logarithm

-> Natural logarithm

-> **See also** Examples of functions

-> Represented by **+**

-> Example: 

-> Represented by -

-> Example: 

-> Represented by *

-> Example: 7*x

-> Represented by /

-> Example: 

-> Represented by **

-> Example: 

-> Represented by **sqr**

-> Example: 

-> Represented by **sin**

-> Example: 

-> Represented by **COS**

-> Example: 

-> Represented by **tan**

-> Example: 

-> Represented by **log**

-> Example: 

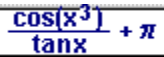
-> Represented by **ln**

-> Example: 

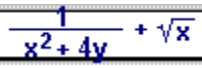
Examples of functions

(sinx/121)+3*x**2

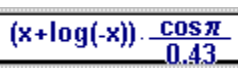
cos(x**3)/tanx+pi

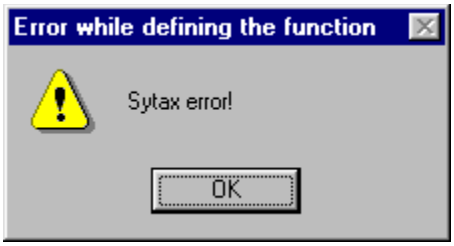


1/(x**2+4*y)+sqrx



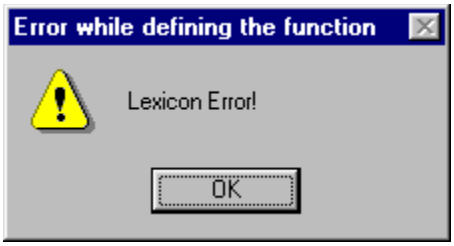
(x+log(-x))*cospi/.43





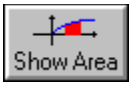
-> The function has a syntax error. The symbols used are valids, but they aren't properly organized.

-> Example : 



-> The function has a lexicon error. You have typed an invalid symbol.

-> Example : 



VisualMethodos is shareware!

You may use this program 30 days free as a trial.
After that time you are expected to either register this program, or remove it from your computer.

Registration fee: US$ 19

What registering will get you:

- The right to use it after the evaluation period (30 days).
- A registration code which will remove the occasional shareware reminder windows.

To register:

- E-mail: **registros@siliconaction.com.br**
- WWW: **http://www.siliconaction.com.br**