

## Parabolic Interpolation for three points

for HP Prime calculator software version 2.1.14730 (2023 04 13)

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Given three (x,y) points, this program will interpolate X or Y using a parabolic equation. The results are displayed on the print terminal.

### Instructions

Run InterpolatorPara program from the toolbox key. On input screen, enter the x,y coordinates of three known points. When solving for y, enter the known x value, and in the solve box, select "y". When solving for x, enter the known y value, and in the solve box, select "x". Then press the OK tab. The results are displayed on the bottom of the print terminal. You may need to scroll to the bottom of the print terminal.

To run the program again, press the Esc key to exit the terminal. Then, press the Enter key to run the program again.

The x and y answers can be accessed by the Vars key (variables oX, oX1, oX2 and oY). oX contains a matrix with two solutions. oX1 and oX2 contain the 1<sup>st</sup> and 2<sup>nd</sup> solution, respectively.

### Example Solving for y

Given (1,0), (4,1.385) and (6,1.787), determine y for x=2.

Input the known data as shown below. Then press the OK tab.

Parabolic Interpolation given 3 points

x1	1	y1	0
x2	4	y2	1.385
x3	6	y3	1.787

x 2      y 0

Solve y

Select variable to solve

Choose   Cancel   OK

- x
- ✓ y
- clear inputs
- clear terminal
- view terminal

The results are displayed on the print terminal. In this example, the Home number format was set to floating with 4 digits.

Terminal

Parabolic Interpolation given 3 points

x1 = 1    y1 = 0  
x2 = 4    y2 = 1.385  
x3 = 6    y3 = 1.787  
---  
x = 2  
y = 0.56593 \*  
---  
y = ax^2 + bx + c  
a = -0.05213  
b = 0.72233  
c = -0.6702

### Example Solving for x

Given  $(-1,2)$ ,  $(0,1)$  and  $(1,3)$ , determine  $x$  for  $y=2.5$ .

Input the known data as shown below. Then press the OK tab.

Parabolic Interpolation given 3 points

x1	-1	y1	2
x2	0	y2	1
x3	1	y3	3

x 0      y 2.5

Solve x

Select variable to solve

Choose Cancel OK

The results are displayed on the print terminal. In this example, the Home number format was set to floating with 4 digits. There are two answers in the form of a matrix. This matrix is returned to the Home screen.

Terminal

Parabolic Interpolation given 3 points

x1 = -1    y1 = 2  
x2 = 0    y2 = 1  
x3 = 1    y3 = 3

---

x = [0.84713, -1.1805]★  
y = 2.5

---

y = ax<sup>2</sup> + bx + c  
a = 1.5  
b = 0.5  
c = 1

Function

InterpolatorPara [0.84713 -1.1805]

Sto Save Load

A matrix with two values is difficult to use on the Home screen. You can access the first or second answer (oX1 and oX2) using the Vars key and User tab.

Function

InterpolatorPara [0.84713 -1.1805]

oX1 0.84713

Sto Save Load