

2.3 Graph a function

Suppose you want to have a good graphical understanding of the function

$$f(x) = \frac{x^4 - x^2 + x - 1}{x^5 - 3x}.$$

2.3.1 Put the function in your calculator

Enter the function with the y= button. Tip1: You can create a fraction by pressing A-lock stat plot f1 , n/d

NORMAL FLOAT AUTO REAL RADIAN MP
Plot1 Plot2 Plot3
INY1 $\frac{X^{4}-X^{2}+X-1}{X^{5}-3X}$
∎NY2=∎
■NY3=
■NY4=
■NY5=
NY 6 =
■NY7=
■ \ Y8=

2.3.2 Display the graph of a function correctly

tip1: Make sure only the functions you're using are displayed. To deactivate/activate a function's display, press y=, and go to the function you want to activate/deactivate. highlight the "=" symbol and press entry solve ("=" means it's activated, "=" means it's deactivated).

Tip2: When the calculator is drawing the graph of a function, it locks itself from doing anything else until the loading symbol 🕷 next to the battery symbol 👔 ends. If you want to abort the drawing, press and , off.

① Press and select Xmin, Xmax according to the problem you want to solve. Since here it is hard to know, we try Xmin: -10 and Xmax: 10.

Choose an Xscl more or less twenty times smaller than the gap between Xmin and Xmax (the role of Xscl is to set the distance between tick marks on the x-axis). Usually we set Xscl to be powers of 10.

② Choose Ymin and Ymax according to the problem chosen. You want Ymin a bit smaller than the minimal y-value desired, and Ymax a bit above the maximal y-value desired.



If you don't know what y-values to choose, press **Zoom** ZoomFit to make the y-values graph prettily ² the function according to what we chose in point ①. It should display this:



3 To display a specific part of the graph (here: the first local minimum), press zoom, Zbox.

Use to move to a point on the screen that you want the top left corner of the screen to be, and press entry solve.

Use again it to the future bottom right part of the screen:







²ZoomFit recalculates YMin and YMax to include the minimum and maximum y-values of the selected functions between the current XMin and XMax. XMin and XMax are not changed.



If you wish to zoom out in order to zoom in to another part of the graph, press
 Coom
 Coom

2.3.3 Graph the sum of functions

Suppose you want graph the sum of the following functions:

$$f(x) = x^2 - 2x + 5 \qquad \qquad g(x) = \frac{x+3}{4}.$$

① Enter the two functions using the y= button:

	NORMAL FLOAT AUTO a+bi D	EGREE MF	Ì 🚺	
	Plot1 Plot2 Plot3			
	■ \ Y1 = X ² -2X+5			
	■NY2目 X+3			
	∎ \ ¥3= ∎			
	NY4=			
	NY7=			
	■NY8=			
The fracti	on is done pressing	A-lock alpha ,	stat plot f1 y=	and n/d

(2) Deactivate the graph of Ψ_1 and Ψ_2 by highlighting the "=" symbol on Ψ_1 and Ψ_2 and pressing entry solve (" \equiv " means it's activated, "=" means it's deactivated):

NORMAL	FLOAT	AUTO	a+bi	DEGREE	MP	Î
Plot1	P1ot	2 P1	lot3			
NY 1 =	=X ² -2	X+5				
■ \Y 2=	= <u>X+3</u> 4					
	•					
∎ \ ¥3=	-					
■NY4=	•					
■NY 5 =	=					
NY 6=	=					
■ ヽ Y 7=	-					

3 define Y_3 as $Y_1+Y_2:$



NORMAL FLOAT AUTO a+bi DEGREE MP	
Plot1 Plot2 Plot3	
■NY1■X ² -2X+5	
■NY2目 X+3	
NY4=	
NY 5 =	
NY7=	
■ \ Y8=	
â laak	ala 44
\circ access Y_1 and Y_2 , press and T_1	arce T4

(4) press $\frac{\text{table 15}}{\text{graph}}$ to display the graph of Ψ_3 (see 2.3.2 to display the graph correctly)

The same goes for subtraction, multiplication or division of two functions.