Increasing the Window MathPrint View

Objectives:

- Using Zoom Out to increase the window
- Understand some limitations of using the zoom menu
- Increasing the window using Window settings

Using Zoom Out to increase the window



Understand some limitations of using the zoom menu

CAUTION: When using Zoom choices 1-4, the calculator waits the user to indicate the new center of the graph before it re-draws.

IMPORTANT: The cursor's location when you press ENTER will be the new center of the graph.

Note: To use a different center, move the cursor using

CAUTION: Using zoom OUT or IN is often confusing, because

- it does not adjust the scales (tick spacing)
- it enlarges (shrinks) both the x-axis and the y-axis by the same amount
- the amount it enlarges (shrinks) has nothing to do with the equation in the Y= menu

entry solve

then press

Example 1 (continued): What window did ZOOM OUT give? There is a blur of ticks on both axes!

	thiset 12
To see the new window settings, press:	window
WINDOW Xmin= U 40 Xmax=40 Xscl=1 Ymin=-40 Ymax=40 Yscl=1 Xres=1 Y=0,00000000000000000000000000000000000	

The window increased the same in both x and y directions, from [-10,10] x [-10,10] to [-40,40] x [-40,40].

Increasing the window using Window settings

PRO TIP: The Zoom Out result from Example 1 isn't good, but it shows information we can use. There are x-intercepts less than half of 40, meaning 20. So Xmin= -20 and Xmax = 20 might work. The graph goes off the screen top and bottom, so Ymin is too large and Ymax is too small.

Example 2: Graph $y = x^3 - 121x$ in a more appropriate window using WINDOW settings. **IMPORTANT:** There is not one right answer! Window choice is partly personal taste.

From Example 1, the x-axis might be $-20 \le x \le 20$, but $-40 \le y \le 40$ is too small. Use a table to identify the smallest and biggest y-values for the new Ymin and Ymax.



The smallest y-value in all of these screens is -5580 and the largest is 5580.

PRO TIP: Choose values for Xmin, Xmax, Ymin and Ymax that divide easily to determine Xscl and Yscl.

To use a near multiple of 100, chop to 5500 or round to 5600.

To use a near multiple of 1000, chop to 5000 or round to 6000. These are even easier to divide!

REMEMBER: Xmin must be less than Xmax, and Ymin must be less than Ymax. Check the negatives!



PRO TIP: When changing window settings, notice whether your calculator automatically erases all of the

. not

old value when you type a new value into the window screen. If it doesn't, press **PRO TIP:** Either or enter will move down the WINDOW screen. table f5 format f3 L6 V graph f0 0 6

Try It!

Graph and adjust window as needed

CAUTION: After changing window settings, use

- 1) $y = \frac{15}{121}x^2 15$ 2) $y = -x^2 + 15$
- 3) $v = \sqrt{x+11}$
- 4) y = |x 14|

Answer Hints

- 1) $y = \frac{15}{121}x^2 15$ is an upward parabola with vertex at (0, -15). Decrease YMIN to -15 or less.
- 2) $y = -x^2 + 15$ is a downward parabola with vertex at (0, 15). Increase Ymax to 15 or more.
- 3) $y = \sqrt{x+11}$ is half of a sideways parabola with vertex at (-11,0). Decrease Xmin to -11 or less.
- 4) y = |x 14| is a V-shape with x-int at (14,0). Increase Xmax to at least 15 or 20.

first.