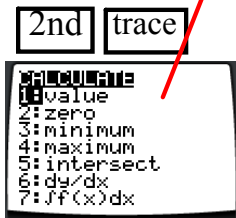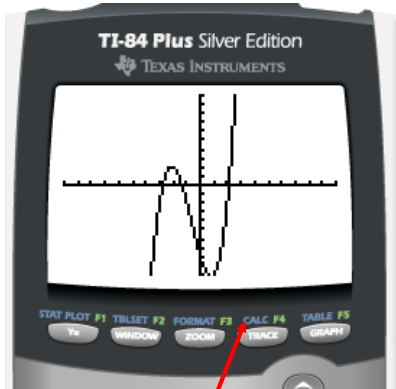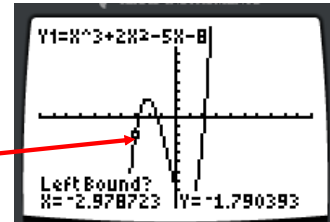# Zeros of the Function on Graphing Calculator

Graph a polynomial function

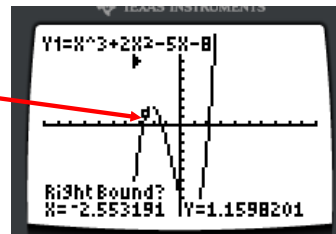Y1=X^3+2X2-5X-8

move cursor to left
side of x-intercept
(zero)

Left Bound?
X=-2.978723 Y=-1.790393

Enter

TI-84 Plus Silver Edition
TEXAS INSTRUMENTS

Y1=X^3+2X2-5X-8

move cursor to right
side of x-intercept
(zero)

Right Bound?
X=-2.553191 Y=1.1598201

STAT PLOT F1 TBLSET F2 FORMAT F3 CALC F4 TABLE F5
Y= WINDOW ZOOM TRACE GRAPH

Enter

2nd trace

Screen will say Guess

Enter

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx

x-intercept (zero) is
given and cursor shows
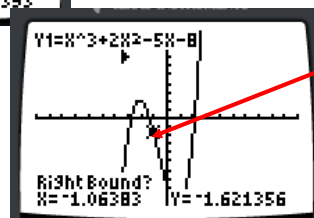it on screen

Choose 2:zero

Zero
X=-2.761557 Y=1E-12
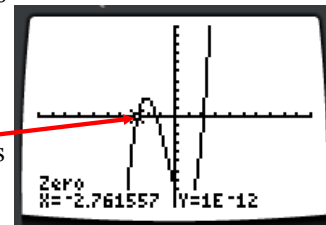
Maximum/Minimum on Graphing Calculator

Similar process as finding a zero. Graph function. Choose Maximum
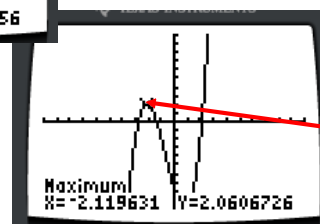(or Minimum) on the Calculate Menu

Y1=X^3+2X2-5X-8

Left Bound?
X=-2.978723 Y=-1.790393
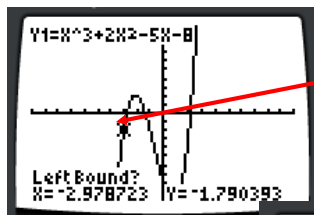
Move cursor on left side of maximum   Enter

Y1=X^3+2X2-5X-8

Move cursor on right side of
maximum   Enter

Right Bound?
X=-1.06383 Y=-1.621356
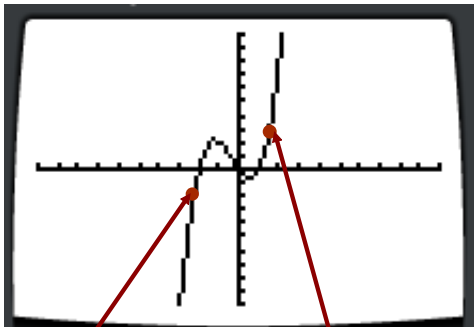
Guess   Enter

maximum

Maximum
X=-2.119631 Y=2.0606726
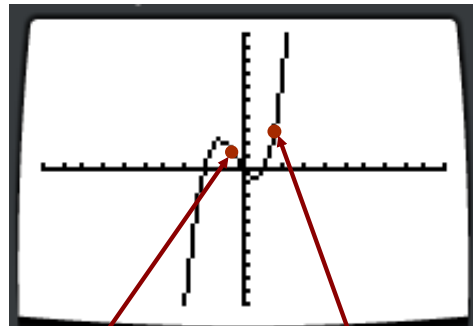
Error Analysis

Finding Minimum

left bound   right bound

Left bound point is below minimum so the calculator won't read the turning point as the minimum. No error message on calculator though.

Finding Zero

left bound   right bound

Both left and right bound points are above the x-axis. (Calculator might give an error message depending on the model). One bound must be above and one below the x-axis. This passes through 2 zeros and you have to find zeros separately.

Finding a Good Viewing Window
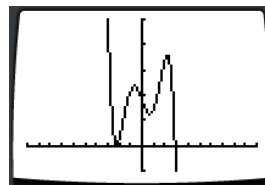
Example: $f(x) = -x^5 + 9x^3 - 12x + 18$

The graph in a standard window*(zoom: 6; -10 ≤ x ≤ 10, -10 ≤ y ≤ 10).*

Ymax

Xmin   Xmax
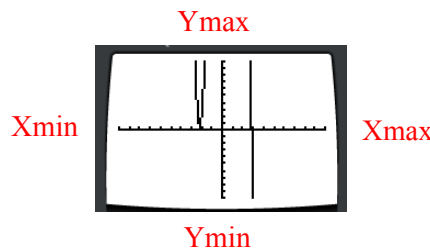
Ymin

In order to see more of the turning points, the window needs to be adjusted. Decide which direction you would like to see more or less of the graph *(x and y min/max are labeled to help)*.

```
WINDOW
 Xmin=-10
 Xmax=10
 Xscl=1
 Ymin=-10
 Ymax=50
 Yscl=10
 Xres=1
```


To see more of the top end, the Ymax was adjusted to 50. The graph now shows the turning points and is better when calculating the minimum and maximums however this viewing window may be difficult to find the zeros of the function.