

AGENDA

- 1) Take out HW to be collected
- 2) Take out Graphing Calculator
Discover
 - How to **graph** a parabola
 - How to find the **coordinates** of the **roots**
 - How to find the **coordinate** of the **vertex**
- 3) You try some!

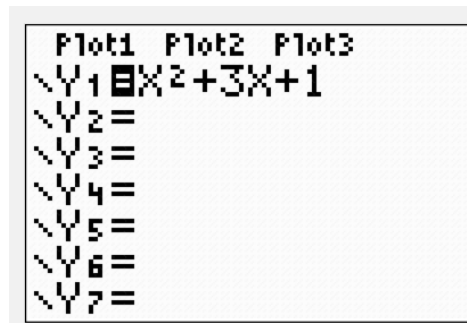
HW: Have an AMAZING VACATION

Graphing Parabolas on the Graphing Calculator

Graph the parabola on your calculator.

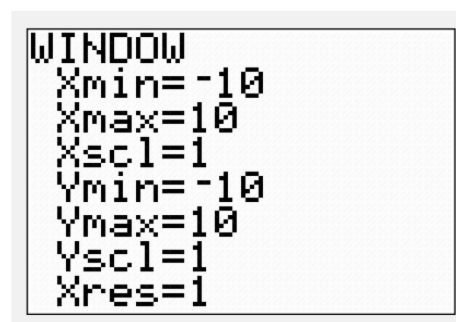
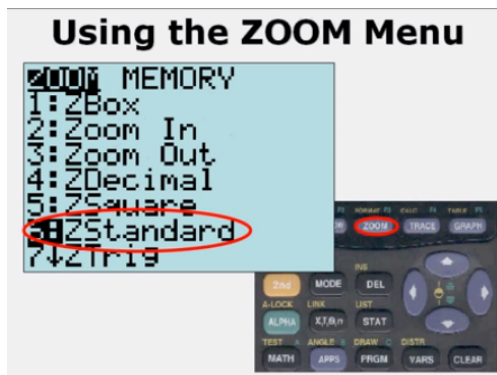
$$y = x^2 + 3x + 1$$

Press $\boxed{Y=}$, and for Y_1 , enter $\boxed{X,T,\Theta,n} \boxed{x^2} \boxed{+} \boxed{3} \boxed{X,T,\Theta,n} \boxed{+} \boxed{1}$.

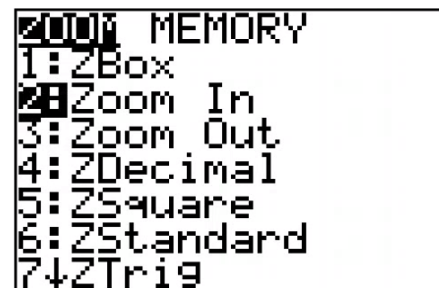
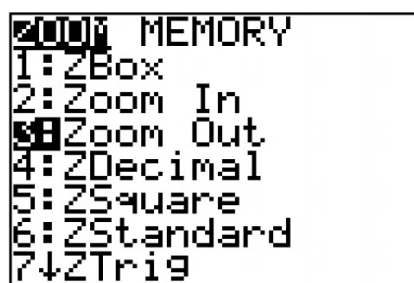
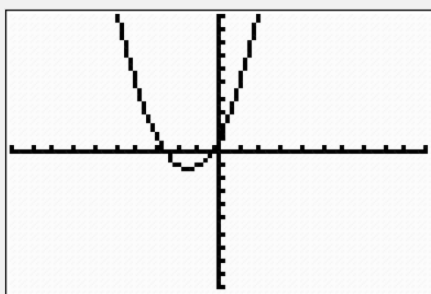


Graphing Parabolas on the Graphing Calculator

Press **WINDOW** to check the window settings. The default viewing window ($X_{min} = -10$, $X_{max} = 10$, $X_{scl} = 1$, $Y_{min} = -10$, $Y_{max} = 10$, $Y_{scl} = 1$) works fine for this graph. (You might want to zoom in if you were interested in the intercepts.)



Press **GRAPH** to graph the parabola.



Finding Roots on the Graphing Calculator . . . Continued

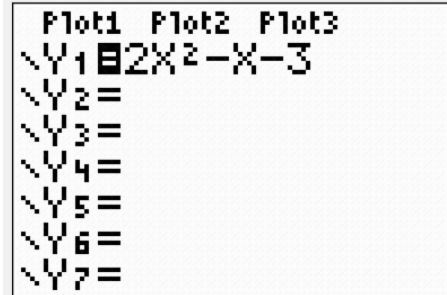
Use your graphing calculator to graph the quadratic function

$$f(x) = 2x^2 - x - 3.$$

Then use the *Zero* feature to find any x -intercepts. Round the answer to the nearest hundredth, if necessary.

Press $\boxed{Y=}$ and enter the function as Y_1 .

Press $\boxed{Y=}$ and, for Y_1 , key in $\boxed{2} \boxed{X,T,\theta,n} \boxed{x^2} \boxed{-} \boxed{X,T,\theta,n} \boxed{-} \boxed{3}$.



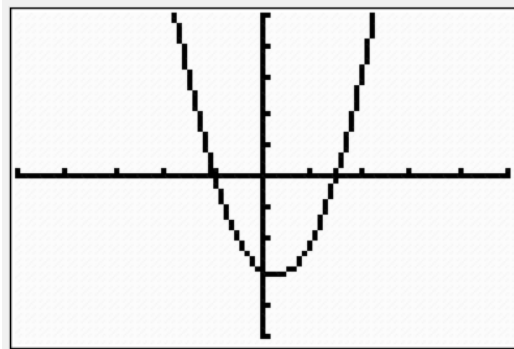
Finding Roots on the Graphing Calculator

Press **WINDOW** to set the size of the graph. What parameters would work best?

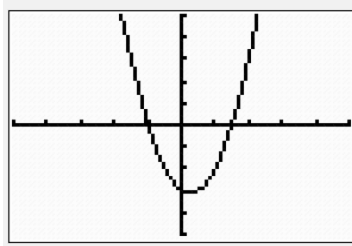
The x -intercepts are both between -2 and 2 , so you might want to zoom in a little closer than usual. Press **WINDOW** and set $X_{\min} = -5$, $X_{\max} = 5$, $X_{\text{scl}} = 1$, $Y_{\min} = -5$, $Y_{\max} = 5$, $Y_{\text{scl}} = 1$.

```
WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-5
Ymax=5
Yscl=1
Xres=1
```

Press **GRAPH** to graph the function.



Finding Roots on the Graphing Calculator . . . Continued



Press **2nd** **[CALC]** and select the *Zero* function.

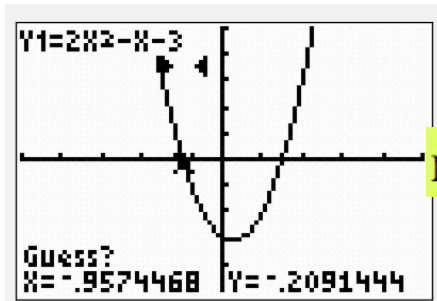
```

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

```

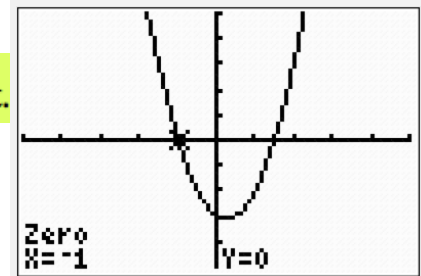
Using the arrow keys **◀** **▶** and the **ENTER** key, select a left bound to the left of the first x -intercept, and a right bound to the right of it (but to the left of the second x -intercept). Then position the cursor somewhere near the intercept and enter a "Guess".

Finding Roots on the Graphing Calculator . . . Continued

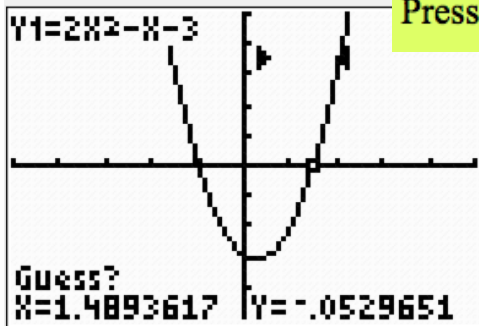


Press **ENTER** to get the intercept.

The calculator gives the first zero as $x = -1$.

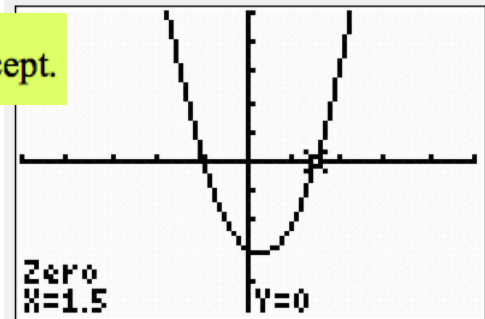


Press **2nd** **[CALC]** **2** to find the next zero. Using the arrow keys **◀** **▶** and the **ENTER** key, select a left bound to the left of the second x -intercept (but to the right of the first) and a right bound to the right of it. Then position the cursor somewhere near the intercept and enter a "Guess".



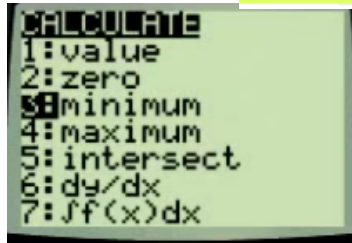
Press **ENTER** to get the intercept.

The calculator gives the second zero as $x = 1.5$.



Finding **Vertex** (Max/Min) on the Graphing Calculator

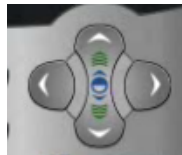
Press **2nd** **[CALC]** and select



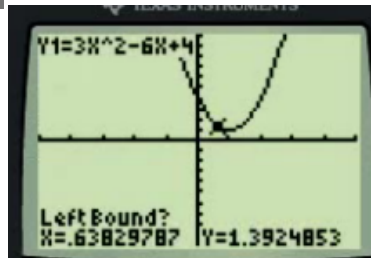
or



use



to scroll to the **LEFT** of the vertex

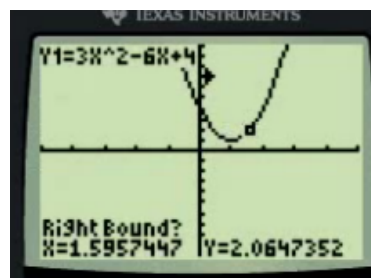


hit **ENTER**

use



to scroll to the **RIGHT** of the vertex



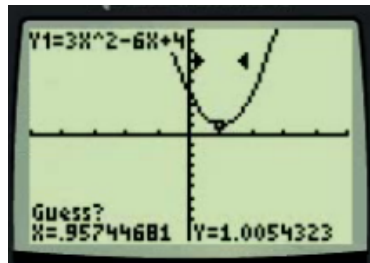
hit **ENTER**

Finding **Vertex** (Max/Min) on the Graphing Calculator
Continued . . .

use



to scroll to YOUR GUESS of the vertex location



hit ENTER



Your vertex is (1,1)

You try some!

Math 518: Graphing Calculator Activity

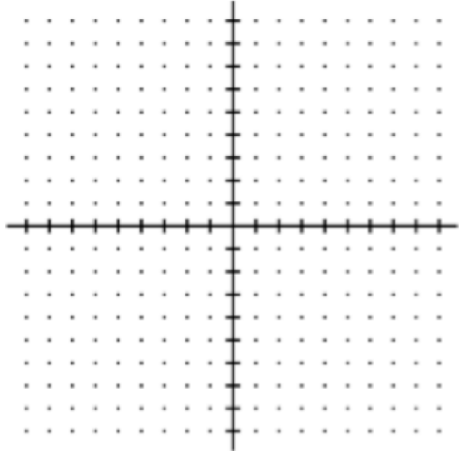
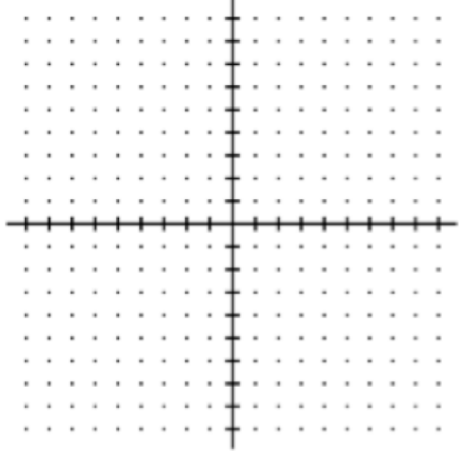
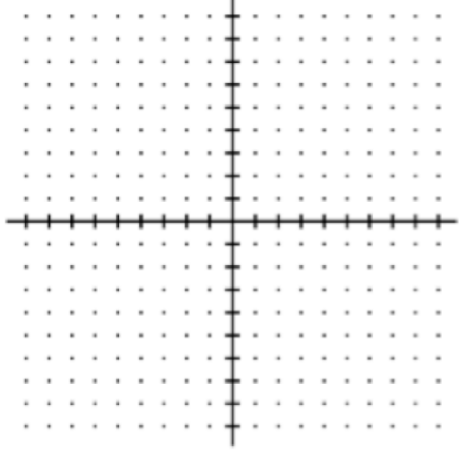
Name _____

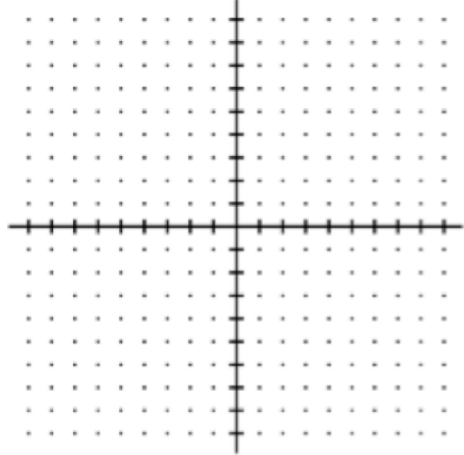
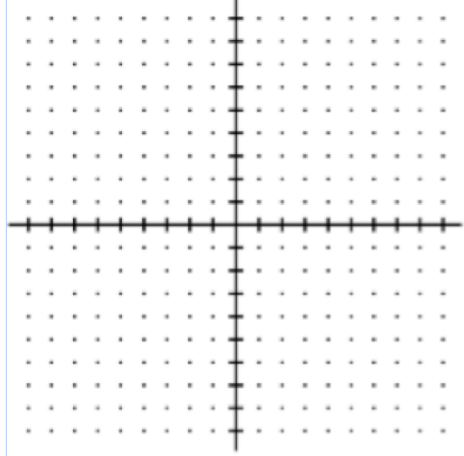
Instructions: Use your graphing calculator to graph each quadratic equation.

Give the **coordinate(s)** of the **y-intercept**, **roots**, and **vertex**.

Sketch the graph on the axis to the right indicating all the known coordinates.

(You might have to change your scale.)

<p>1) $y = 3x^2 + 9x - 3$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____)</p> <p style="padding-left: 40px;">(____, ____)</p> <p>c. vertex: (____, ____)</p>	
<p>2) $y = -0.25x^2 + 2x + 4$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____)</p> <p style="padding-left: 40px;">(____, ____)</p> <p>c. vertex: (____, ____)</p>	
<p>3) $y = -0.4x^2 + 7x + 13$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____)</p> <p style="padding-left: 40px;">(____, ____)</p> <p>c. vertex: (____, ____)</p>	

<p>4) $y = 10x^2 - x - 7$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____) (____, ____)</p> <p>c. vertex: (____, ____)</p>	
<p>5) $y = x^2 - 2x - 3$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____) (____, ____)</p> <p>c. vertex: (____, ____)</p>	
<p>6) $y = -4x^2 - 28x + 36$</p> <p>a. y - intercept: (____, ____)</p> <p>b. roots: (____, ____) (____, ____)</p> <p>c. vertex: (____, ____)</p>	