

## The St. Louis Arch—Gateway to the West

Using Technology: Using a TI83/84 (0, 0)  
(315, 630)  
 Enter the 3 data points: (630, 0)

Step 1: Clear the memory

Press 2nd + 712 enter

Step 2: Turn on stat plot

Press 2nd Y= enter on enter 2nd mode

Step 3: Enter the data points

Press stat enter L1 0 315 630 →  
L2 0 630 0

L1	L2	L3	Z
0	0	-----	
315	630		
630	0		
L2(4) =			

Step 4: generate the equation using quadreg (quadratic regression)

Press stat → 5 enter 2nd stat enter ,  
2nd stat ↓ enter enter

Your main screen should have  
 Quadreg L1,L2

**QuadReg**  
 $y = ax^2 + bx + c$   
 a =  
 b =  
 c =

Verify with  
 your teacher

With the number generated from your calculator you can now fill in the table below and then use your calculator to graph the equation! Notice how the actual curve hits each of the data point you entered!! If this is the first time for students trying this, it can be confusing. After a couple of attempts, allow students to use the data given in the lesson plan to fill in the equation below and enter it into the y= and then graph.

$$f(x) = \underline{\hspace{2cm}} x^2 + \underline{\hspace{2cm}} x + \underline{\hspace{2cm}}$$

Step 5: adjust the window on your calculator, press and change it to look like the following:

Press window

WINDOW	
Xmin=	-10
Xmax=	700
Xscl=	1
Ymin=	-10
Ymax=	700
Yscl=	1
Xres=	1

## The St. Louis Arch—Gateway to the West

Draw the St. Louis Arch, modeled by the equation we came up with using technology and the 3 known points! Label the important points

$(0, 0)$

$(315, 630)$

$(630, 0)$

- Vertex
- Endpoints
- Line of symmetry
- Y intercept
- Equation in standard form
- Use Tails Plus!!!

