

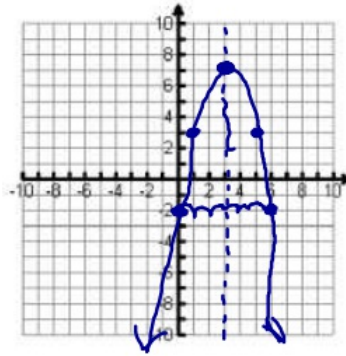
Graphing Quadratics Unit IN CLASS Day 5  
 GRAPHING CALCULATOR REQUIRED!!!

# Graphing with a Graphing Calculator

Find the characteristic parts of each function. Use this information to produce the graph.

A)  $y = -x^2 + 6x - 2$

Characteristic	Value
Vertex	$(3, 7)$
Axis of Symmetry	$\frac{-b}{2a} = \frac{-6}{2(-1)} = 3$
y-intercept	$(0, -2)$
Point symmetric to y-intercept	$(6, -2)$
x-intercept(s)	



x	y
0	-2
1	3
2	6
3	7
4	6
5	3
6	-2

$4,36 \times 10^3$

4360

Vertex x

Write the key strokes below for finding each characteristic:

Finding the x-intercepts: [Enter Equation Y=], [2nd], [Trace] (Calculate)  
 [2: zero], Scroll left bound [ENT], Right [ENT], [ENT]

Finding the vertex: [2nd] [Trace], 3 or 4 min/max, Left & Right

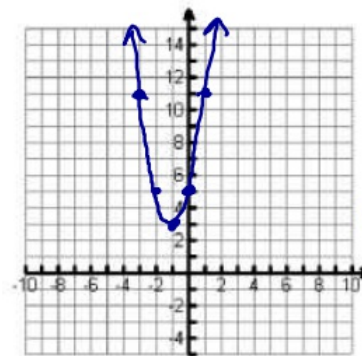
Finding the table of values: [2nd] [Graph]

Finding y-intercepts: [2nd] [Trace] 5; Intersect

How to change the window: Window or Zoom

B)  $f(x) = 2(x+1)^2 + 3$

Characteristic	Value
Vertex	$(-1, 3)$
Axis of Symmetry	$x = -1$
y-intercept	(plug 0) $(0, 5)$
Point symmetric to y-intercept	$(-2, 5)$
x-intercept(s)	None



x	y
-3	11
-2	5
-1	3
0	5
1	11

Vertex

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Modeling real life with Quadratic Equations

1. What does it mean in math to model?

*Creating a function that represents*

2. What are the domains for the two problems on the previous page?

*$(-\infty, \infty)$*

3. In the following scenario what would the **REASONABLE** domain be?

The path of an arrow shot in the air can be modeled by the function:

$h(t) = -16t^2 + 144t$ , where  $h$  is the height, in feet, of the arrow above the ground  $t$  seconds after it is released.

*$(0, \infty)$*

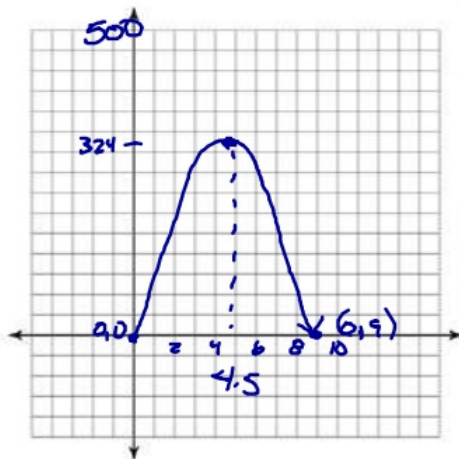
4. Why are your answers to 2 and 3 different?

*negative time.*

5. The path of an arrow shot in the air can be modeled by the function:

$h(t) = -16t^2 + 144t$ , where  $h$  is the height, in feet, of the arrow above the ground  $t$  seconds after it is released.

Graph this function below.



a. What is the maximum height the arrow reaches?

*Vertex*  

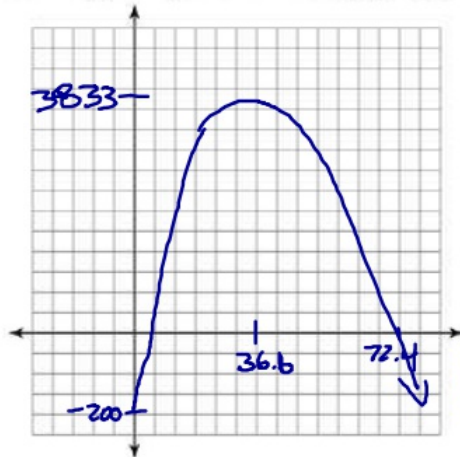
$$\frac{-b}{2a} = \frac{-144}{2(-16)} = \frac{144}{32} = (4.5, 324)$$

b. What is a reasonable range?

*R:  $(0, 324)$*

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6. The demand for plastic storage containers depends on their price. A retail manager determines that the number of containers she can sell at a price of  $x$  dollars each is given by the formula  $d(x) = -3x^2 + 220x - 200$ . Graph this function above.



$V(36.6, 3833)$

yes, I can have a negative \$

- What are a REASONABLE domain and range for this situation?  
 window:  $[0, 100]$   $R: [-200, 6000]$
- At what price will the demand for the containers be at a maximum?  
 \$36.60
- How many containers can she expect to sell at this price?  
 3,833

7. A museum curator needs to frame a rectangular painting. The painting is 24" by 16". If the frame is to be width  $x$ , what is the function for the area of the painting, including the frame? (First draw a picture)

$A = l \cdot w = (24+x)(16+x)$

$l = 24+x$

$w = 16+x$

- What is a reasonable domain for this situation?  
 $[0, 30]$
- What would be the area of the whole painting (with the frame) if the value of  $x$  was 2.5?  
 $A = (24+2.5)(16+2.5)$   
 $A = 490.25 \text{ in}^2$
- What is the area of just the painting?  
 $A = 24 \times 16 = 384 \text{ in}^2$
- What is the area of just the frame when  $x$  is 2.5"?  
 $A = 490.25 \text{ in}^2$

