

# PARABOLA SELFIE

**OBJECTIVE:** You will analyze a parabola in the real world by demonstrating your knowledge and understanding of the following skills:

- Find a parabola in the real world and identify it's dimensions
- Graph the parabola and determine the following characteristics of the function:
  - Domain and Range
  - Minima/Maxima
  - Intervals of Increase and Decrease
  - Vertex
  - A point and a reflection point
  - Axis of Symmetry
  - Zeros
  - Y-Intercept
- Write an equation (vertex form and standard form) that represents the parabola

## PART A: Parabola Selfie

Find a real life parabola and do the following:

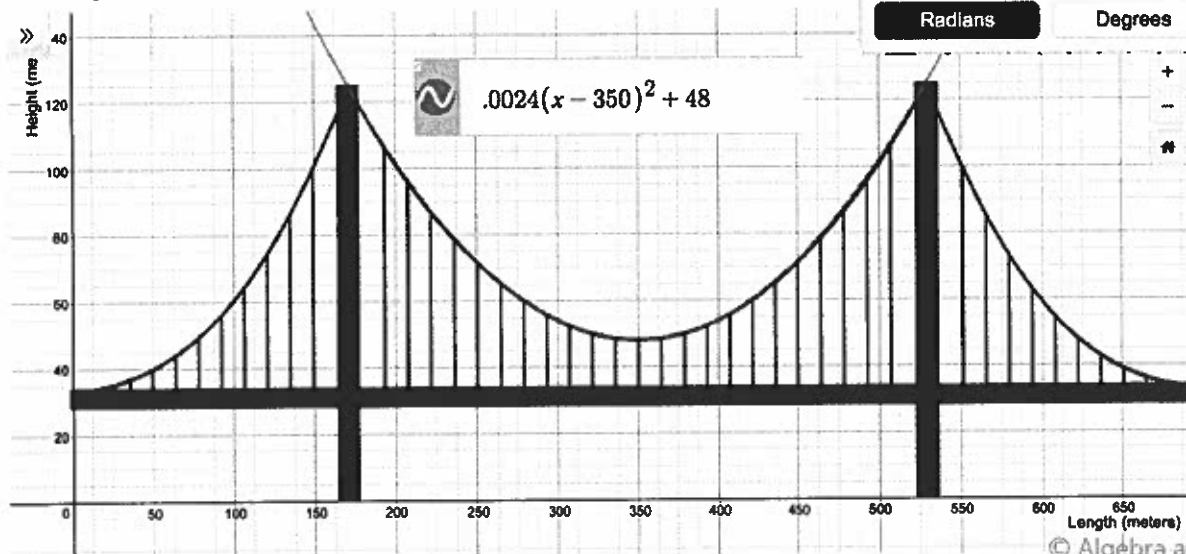
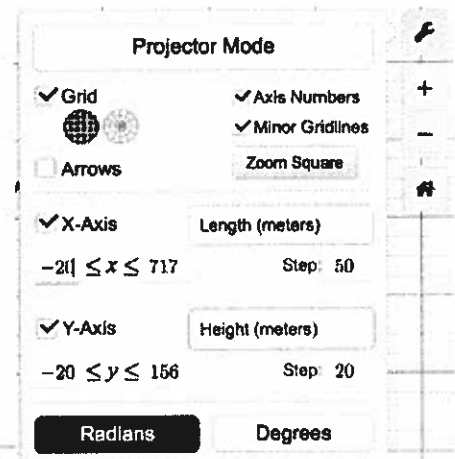
- Take a selfie with it!
- Take another picture of the parabola, so it can be used on a coordinate plane.
- Find the dimensions of your parabola (may need to use Google, ex: McDonald's arch).
- Explain what your parabola is and where you found it.



## PART B: Graph Your Parabola

Use Desmos (online graphing calculator) to graph your parabola:

- Insert your parabola into a Desmos graph. Move the parabola so it is in the first quadrant.
- Change the settings to the appropriate dimensions for your parabola and adjust the size of your parabola, if necessary.
- After you do Part D, graph your equation and two points to ensure it matches your parabola picture.



Name/Group: \_\_\_\_\_

### PART C: Characteristics of My Parabola

Fill in the table with the information from your parabola selfie.

Axis of Symmetry		Domain	
Vertex		Range	
Zero(s)		Interval of Increase	
Y-Intercept		Interval of Decrease	
Point and Reflection Point		Minima/Maxima	

### PART D: Quadratic Equation

Write the quadratic equation for your parabola in standard form and vertex form. Show how you found your "a" in vertex form and show your work for converting from vertex form to standard form.

### Part E: Put it all together.

Create a poster board that includes:

- information from Part A: dimensions, what your parabola is, and where you found it.
- the graph of your parabola from Desmos
- the table from Part C
- Part D equations and your work

Turn in separately:

- Parabola Swap
- Rubric

### EXAMPLE

$y = \frac{1}{10}(x-3.25)^2 + 1.5$  Pringle Parabola

Axis of Symmetry	$x = 3.25$	Domain	$(-\infty, \infty)$
Vertex	$(3.25, 1.5)$	Range	$(1.5, \infty)$
Zero(s)	None	Interval of Increase	$(3.25, \infty)$
Y-intercept	2.55	Interval of Decrease	$(-\infty, 3.25)$
Point and Reflection Point	$(1.2)$ $(5.5, 2)$	Min./Max.	Min./ma. $(3.25, 1.5)$

WORK

$$y = \frac{1}{10}(x-3.25)^2 + 1.5$$

$$= \frac{1}{10}(x^2 - 6.5x + 10.5625) + 1.5$$

$$= \frac{1}{10}x^2 - 0.65x + 1.05625 + 1.5$$

$$y = \frac{1}{10}x^2 - 0.65x + 2.55625$$

Vertex form  $y = \frac{1}{10}(x-3.25)^2 + 1.5$   
 Standard form  $y = \frac{1}{10}x^2 - 0.65x + 2.55625$

This is me, in my room, with a queso fried Pringle!