Example 1: Find the Maximum or Minimum

Using Desmos, find the coordinates of the maximum or minimum of each of the following graphs.

(a) $y = 3x^2$ Maximum or minimum   Value: _____

(b) $y = x^2 - 9$ Maximum or minimum   Value: _____

(c) $y = -2x^2 + 32$ Maximum or minimum   Value: _____

Recall:

Given a quadratic equation of the form $y = ax^2$, describe the effect of a on the graph of $y = x^2$.

- if a is negative, the graph....

- if a is between 0 and 1 (ie. decimal or fraction), the graph...

- if a is greater than 1, the graph...

Example 2: Narrowest to Widest

Without graphing, order the parabolas in each set from narrowest to widest.

(a) $y = \frac{1}{3}x^2 - 7$ $y = x^2 - 7$ $y = 3x^2 - 7$

(b) $y = -4x^2 - 7$ $y = -\frac{1}{2}x^2 - 7$ $y = -0.75x^2 - 7$

Example 2: Interpret the Zeros of a Quadratic Relation

This building contains the equipment that pumps water from Lake Ontario to the Woodward Avenue Water Treatment Facility. A cross-section of the building is in the shape of a parabola.

It's shape can be modelled by the quadratic relation $h = -0.45w^2 + 18$, where h represents the height in metres and w represents the horizontal distance in metres.
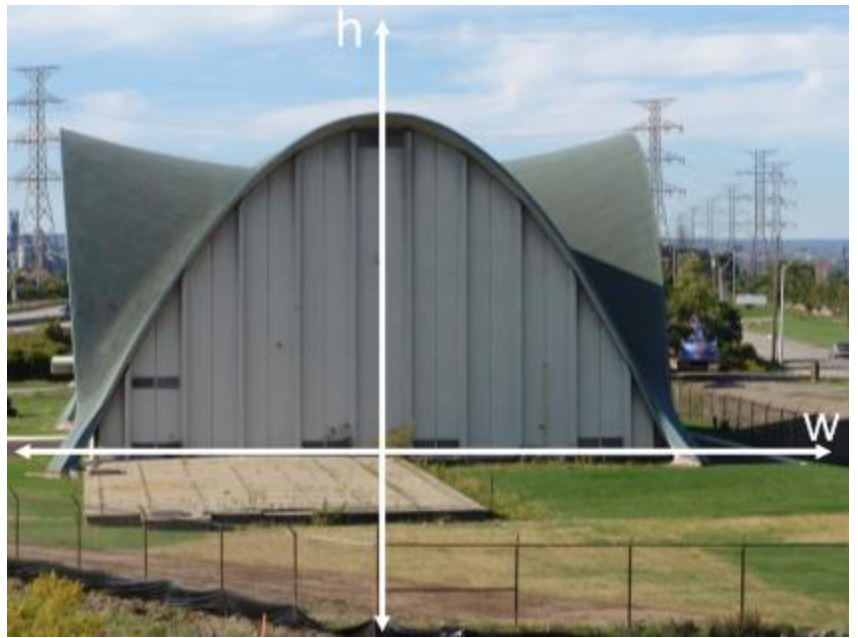
(a) Use Desmos to graph the relation.

(b) Find the height of the building.

(c) Find the width of the building ground level.

Homework: Section 8.3 Handout