

Investigation 1

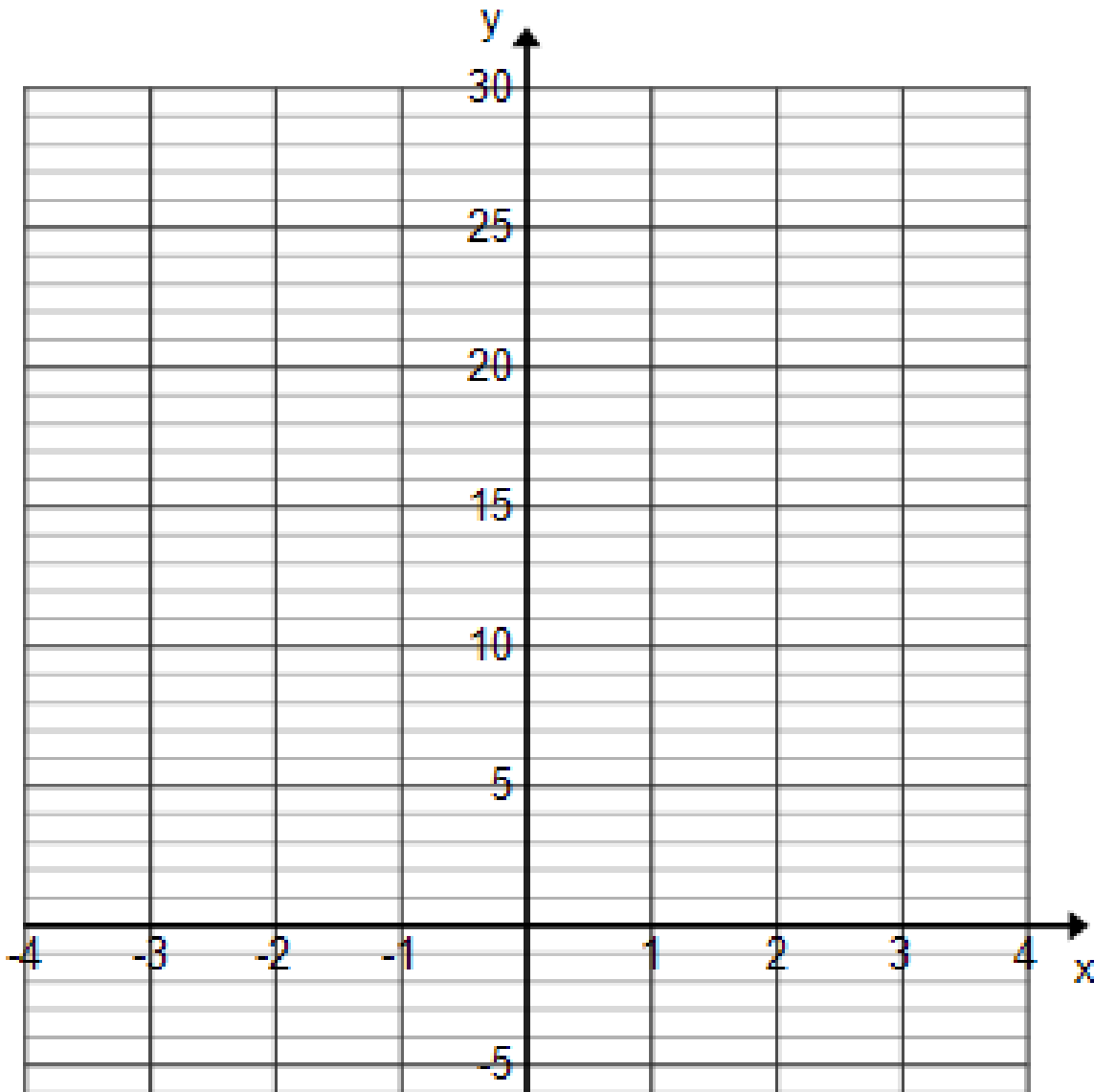
In Desmos, graph the following four equations on the same grid.

1. $y = x^2$ 2. $y = 2x^2$ 3. $y = 3x^2$ 4. $y = 4x^2$

Answer the following questions:

(a) How did each parabola compare to the previous parabola?

(b) Sketch the four parabolas on the grid below. Label each parabola with its equation.



Investigation 2

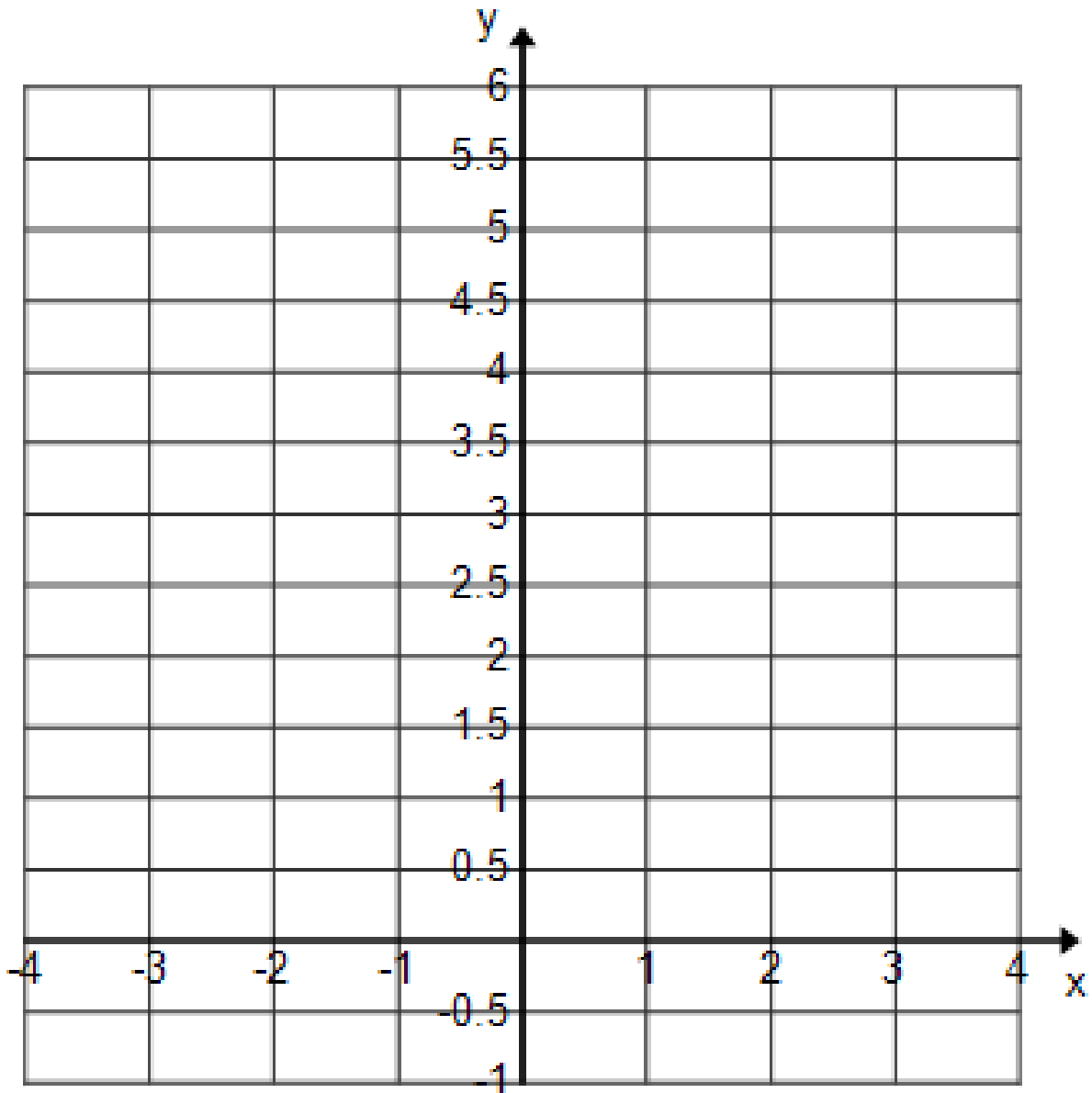
Clear your previous equations and graph the following four equations on the same grid.

1. $y = x^2$ 2. $y = 0.5x^2$ 3. $y = 0.25x^2$ 4. $y = 0.2x^2$

Answer the following questions:

(a) How did each parabola compare to the previous parabola?

(b) Sketch the four parabolas on the grid below. Label each parabola with its equation.



Investigation 3

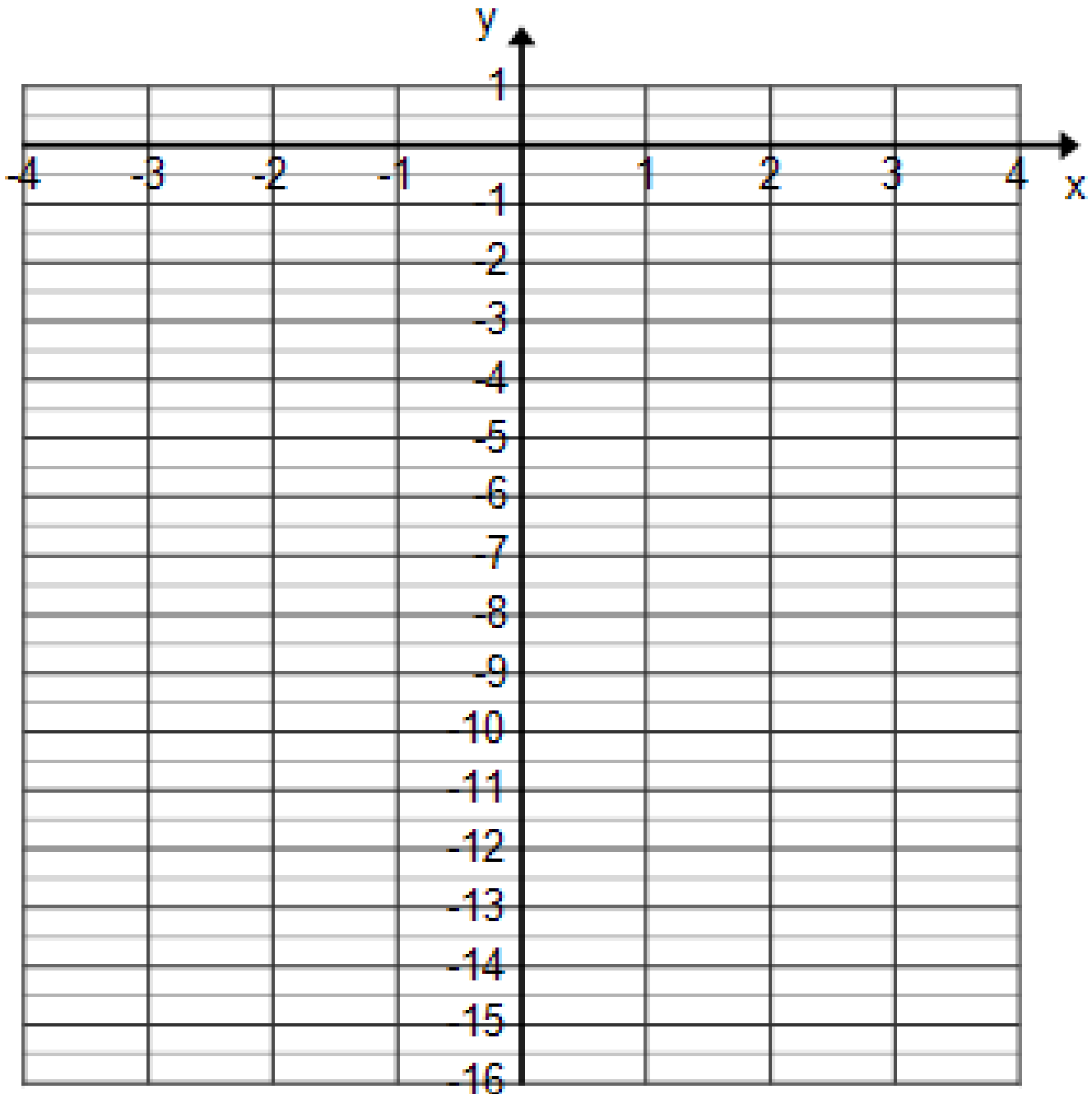
Clear your equations. In Desmos, graph the following four equations on the same grid.

1. $y = -x^2$ 2. $y = -2x^2$ 3. $y = -4x^2$ 4. $y = -(0.5)x^2$ 5. $y = -(1/3)x^2$

Answer the following questions:

(a) How did each parabola compare to the previous parabola?

(b) Sketch the five parabolas on the grid below. Label each parabola with its equation.



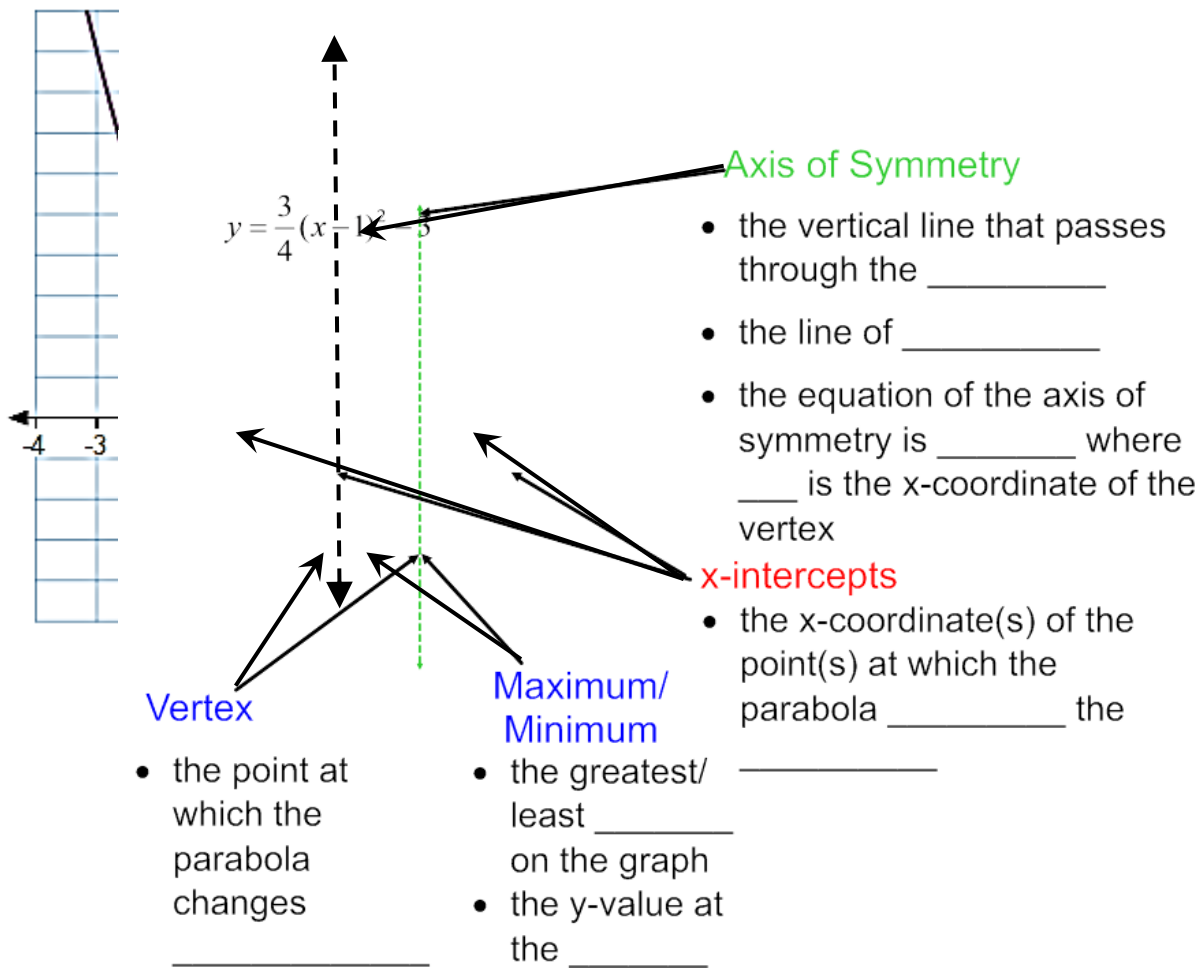
Reflect: Given a quadratic equation of the form $y = ax^2$, describe the effect of a on the graph of $y = x^2$.

- 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...

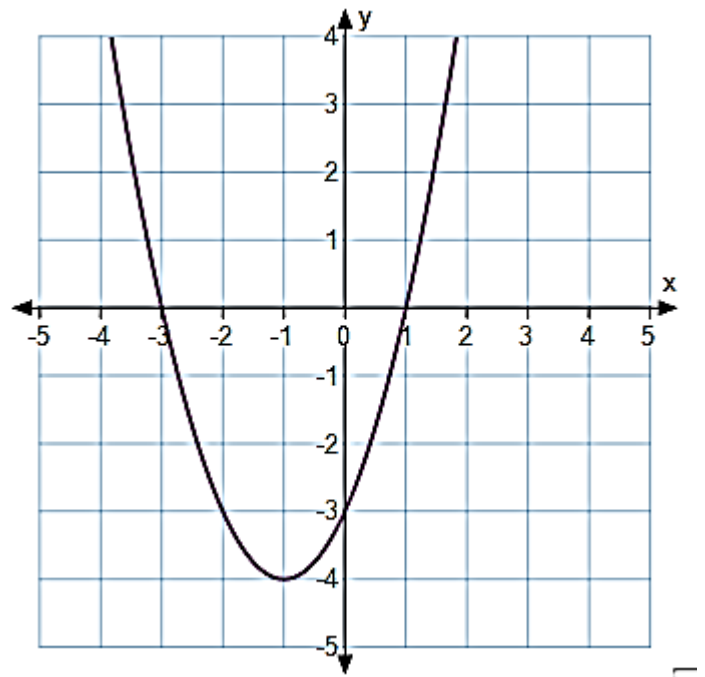
The Key Features of a Parabola



Example 1

Identify the following for the quadratic relation shown:

- (a) the coordinates of the vertex
- (b) the equation of the axis of symmetry
- (c) the y-intercept
- (d) the maximum or minimum value
- (e) the x-intercepts



Example 2

A quadratic relation is given by the equation $y = 2x^2 - 4x + 6$.

- (a) Use Desmos to graph the equation.
- (b) Identify the maximum or minimum value and the coordinates of the vertex.
- (c) Write the equation of the axis of symmetry.
- (d) Identify the y-intercept.
- (e) Identify the x-intercepts.

Homework: Section 6.3 Handout

Note: When the homework says "use a graphing calculator", you are to use DESMOS