You've Got to Move It! Transforming Mathematics

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Outline of Workshop

1. Moving Functions
    - Shifty Behavior
    - Human Graphs
    - Transformation Aerobics
2. Using Appropriate Tools Strategically
    - Modify
    - Sketch it on a photo
    - What's My Dynamic Graph?
3. Maximum Area with a Twist
4. Largest Triangle?

A complete handout with investigations and materials used in the workshop are available through the NCTM or at the following website (or scan QR code): http://north-morris.net.temp.guardedhost.com/jennifer-north-morris.html

$$y = x$$

$$y = x + 2$$

$$y = 2x$$

$$y = x - 1$$

$$y = -x$$

$$y = -x + 2$$

$$y = 2$$

$$y = -3$$

$$y = x^2$$

$$y = x^2 + 1$$

$$y = -x^2$$

$$y = -x^2 + 2$$

$$y = (x-2)^2$$

$$y = x^3$$

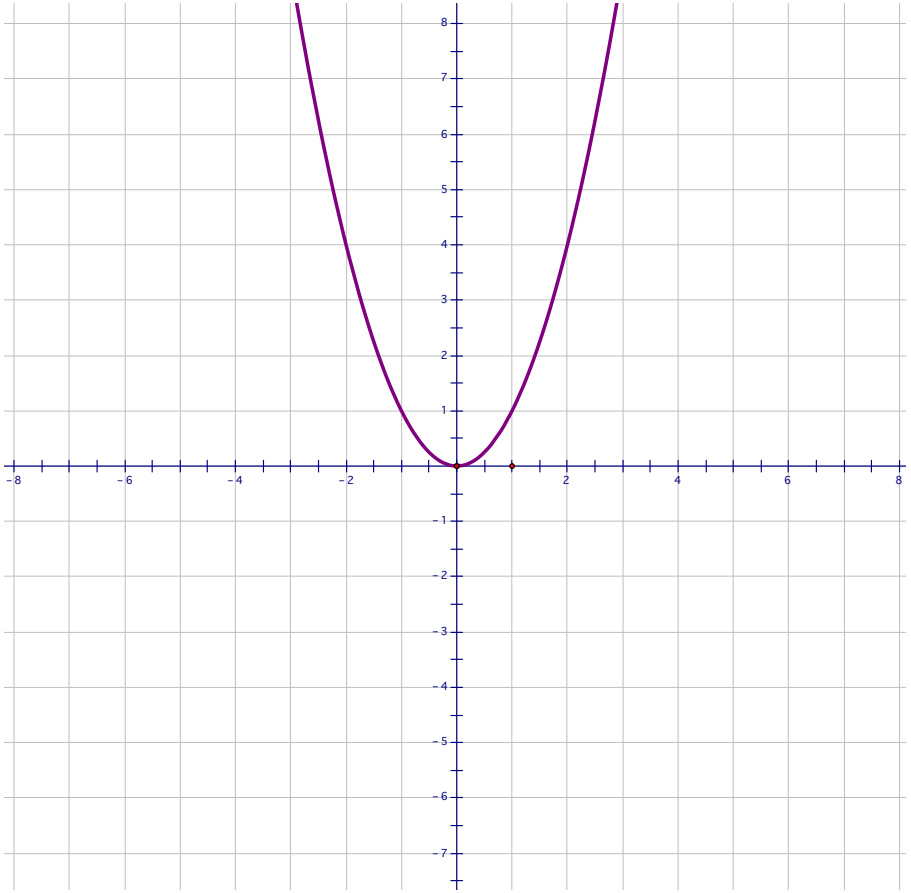
$$y = |x|$$

$$y = |x| + 3$$

$$y = |x + 1|$$

$$y = |x - 1| + 2$$

$$y = \frac{1}{x}$$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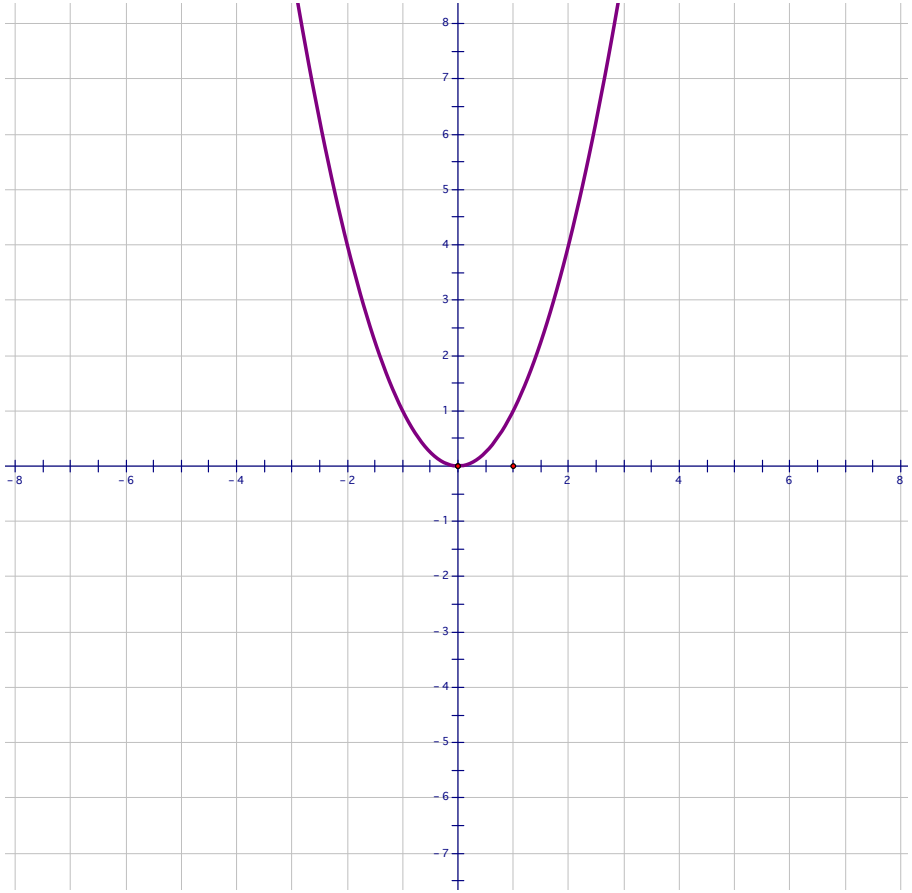
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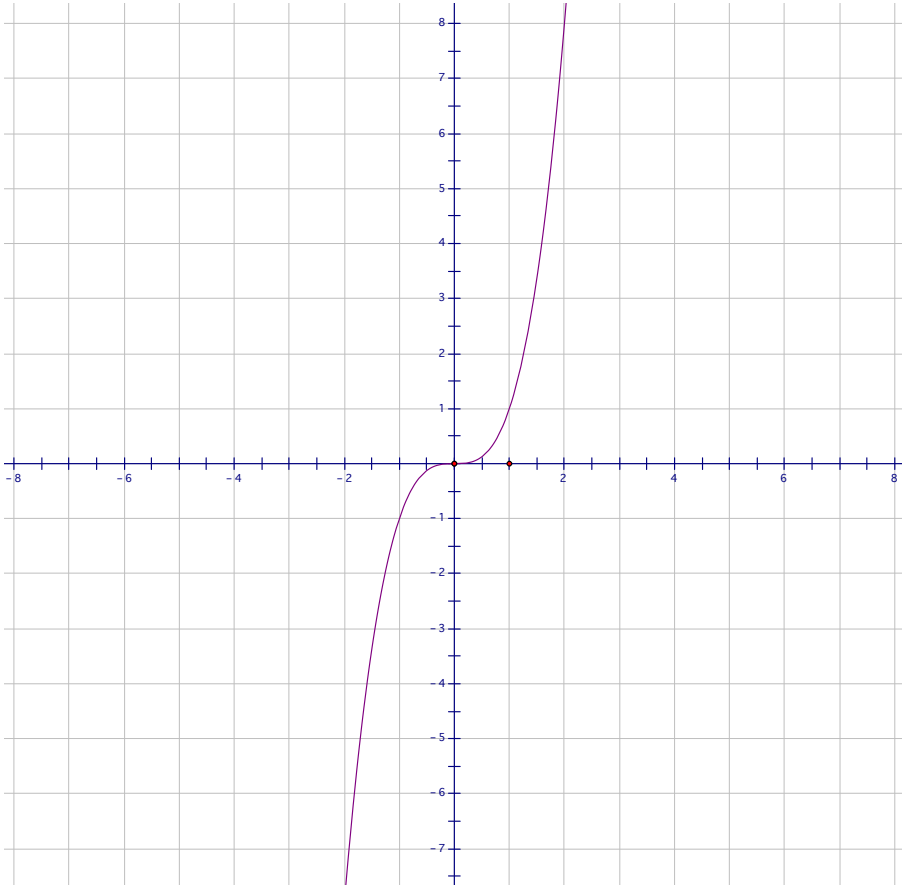
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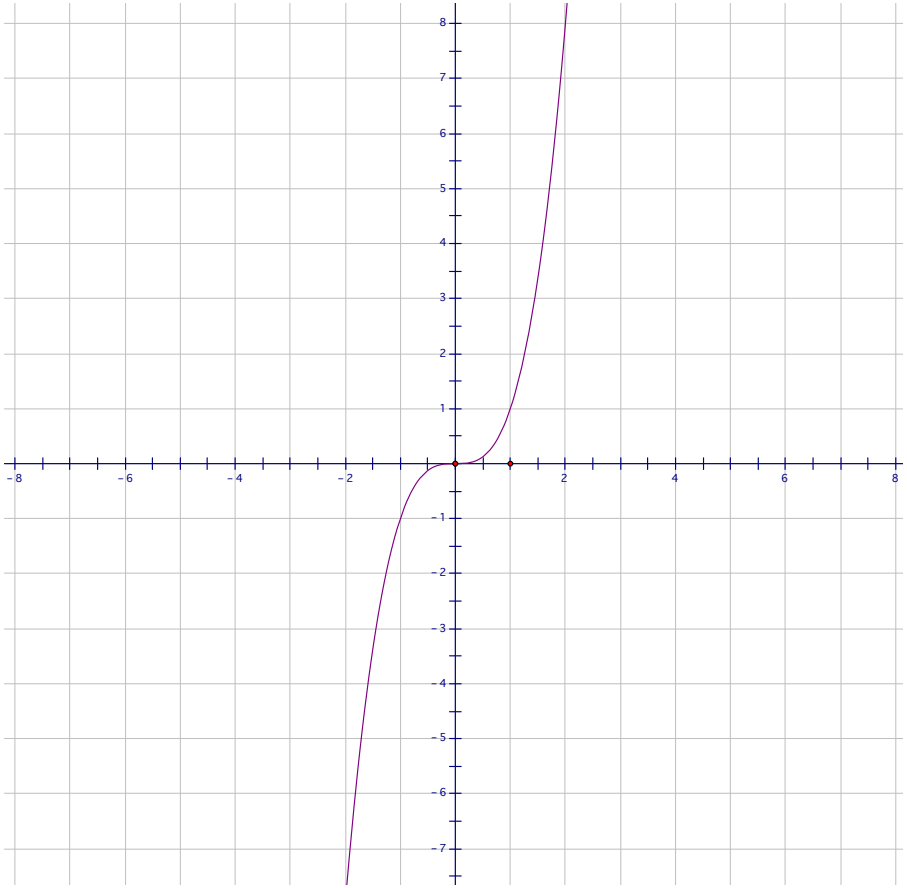
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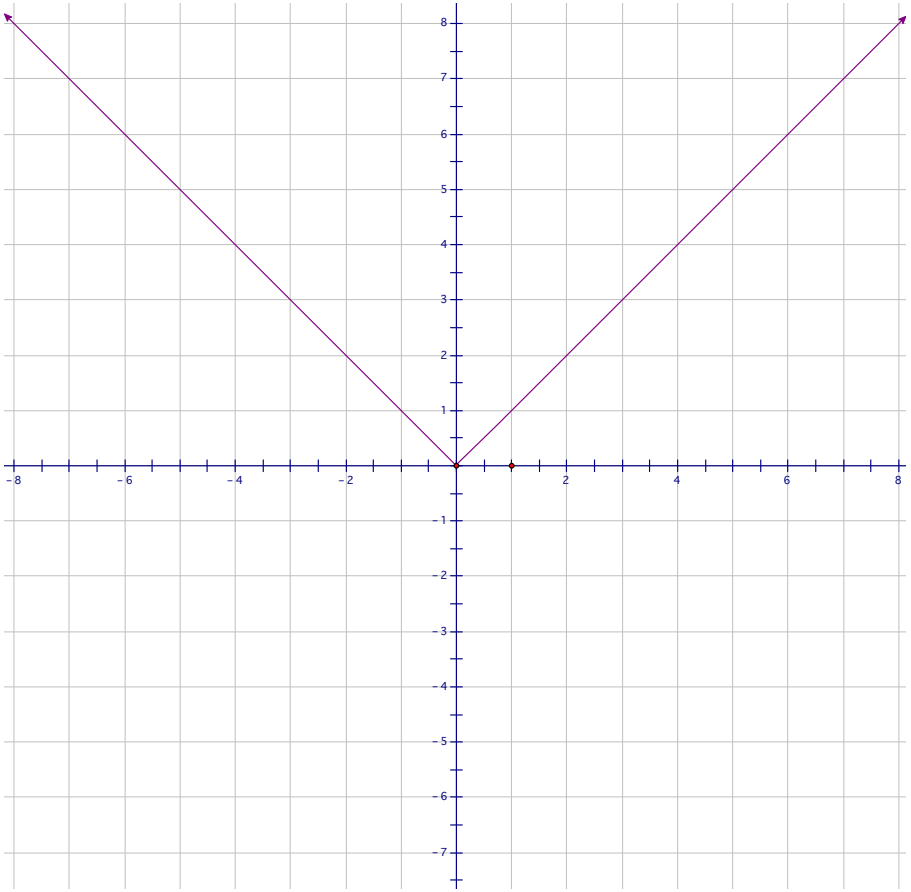
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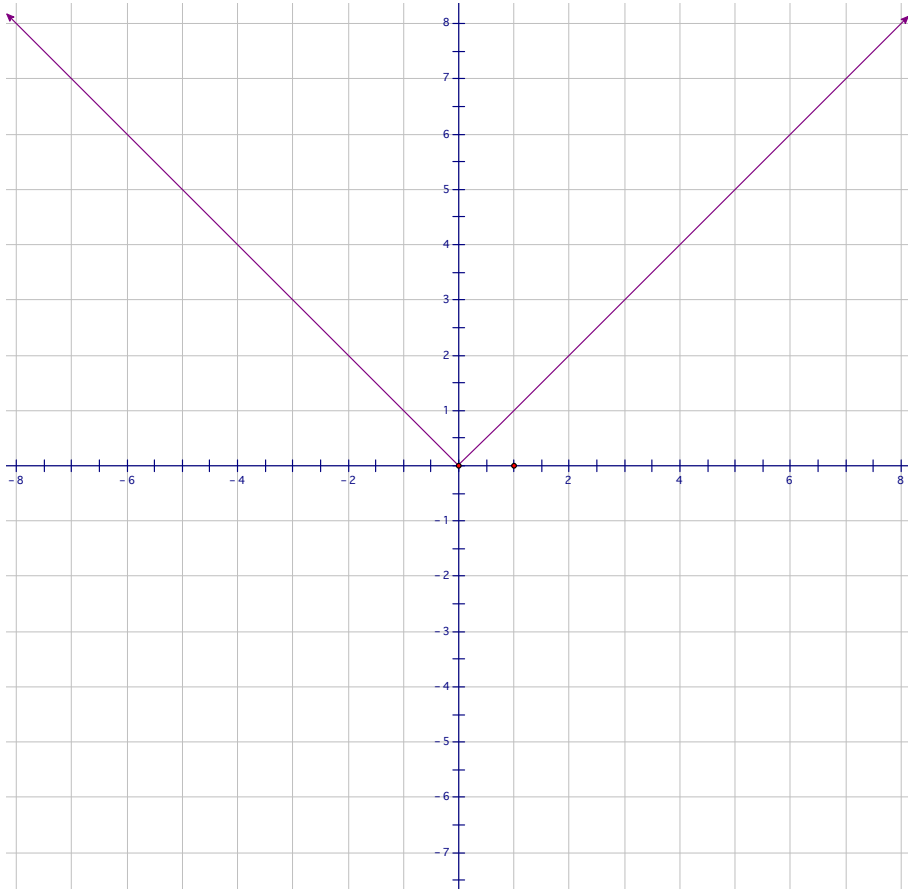
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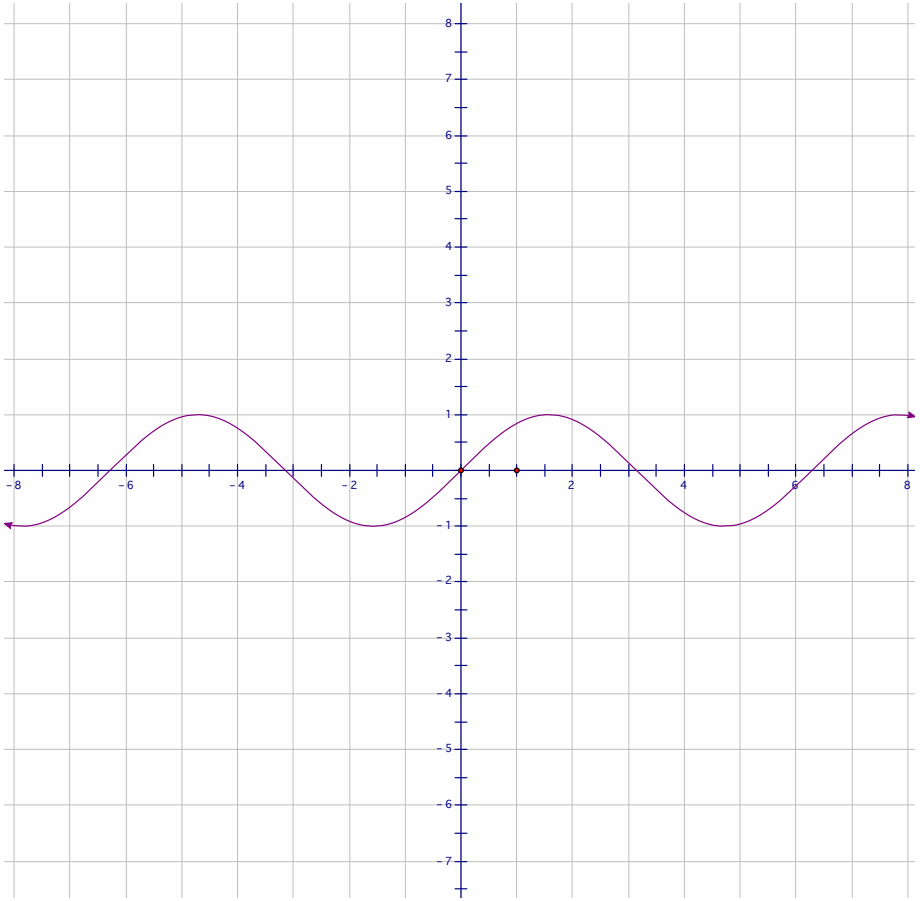
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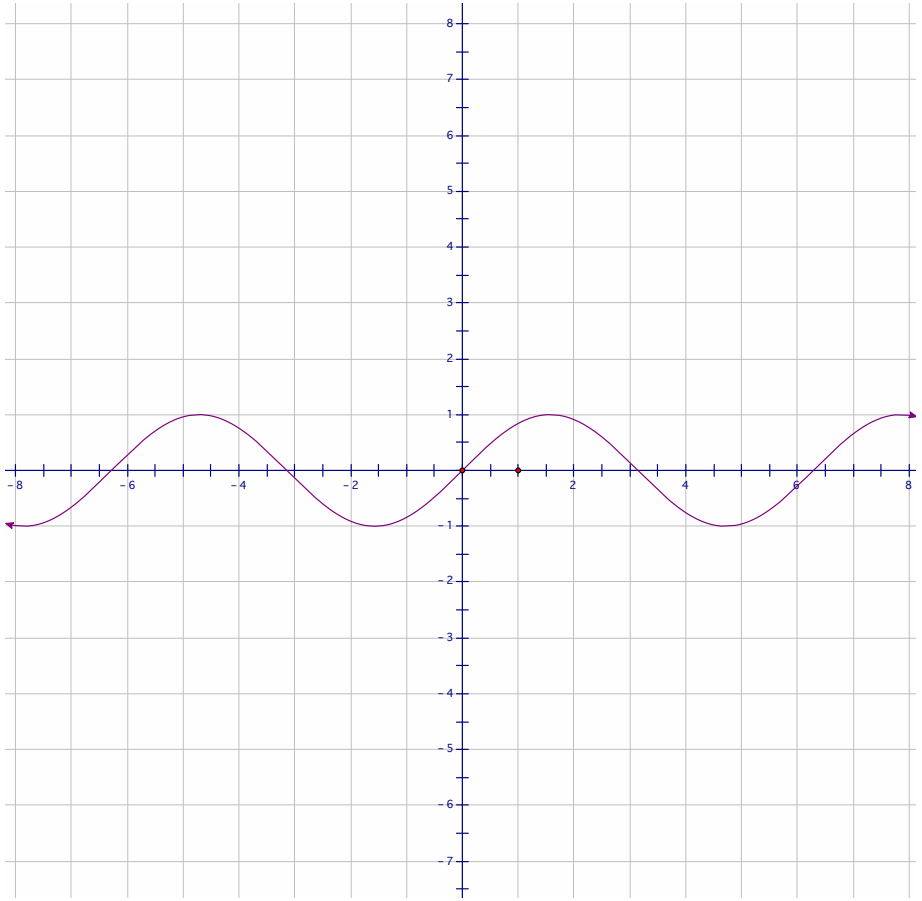
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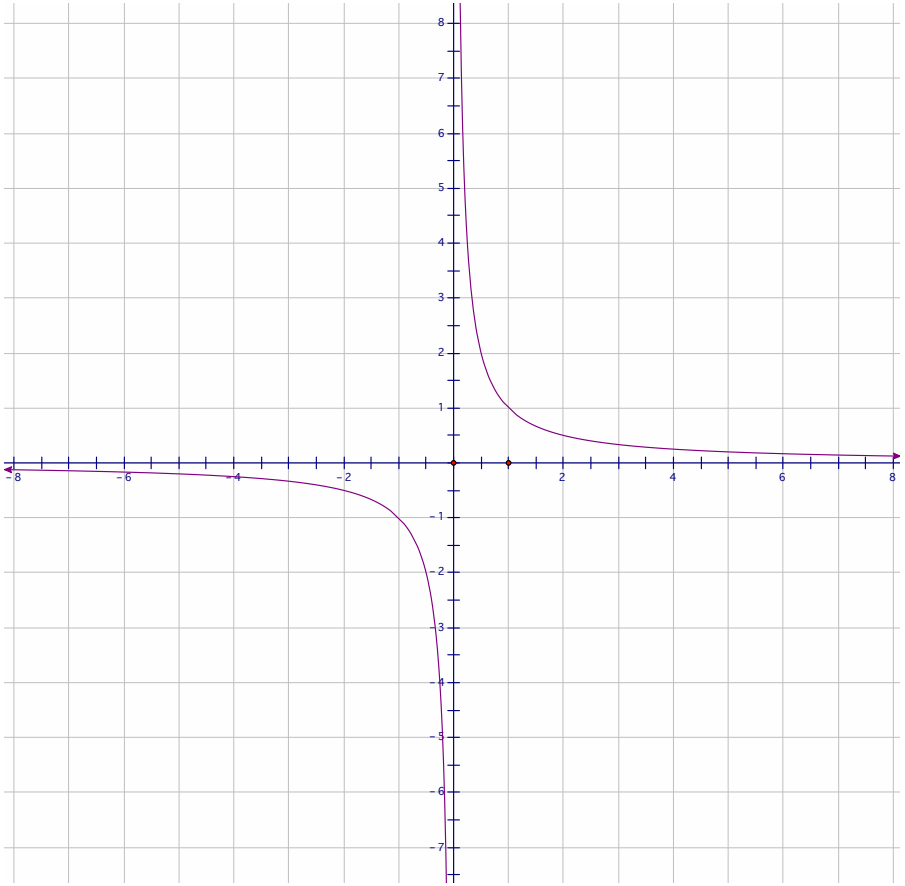
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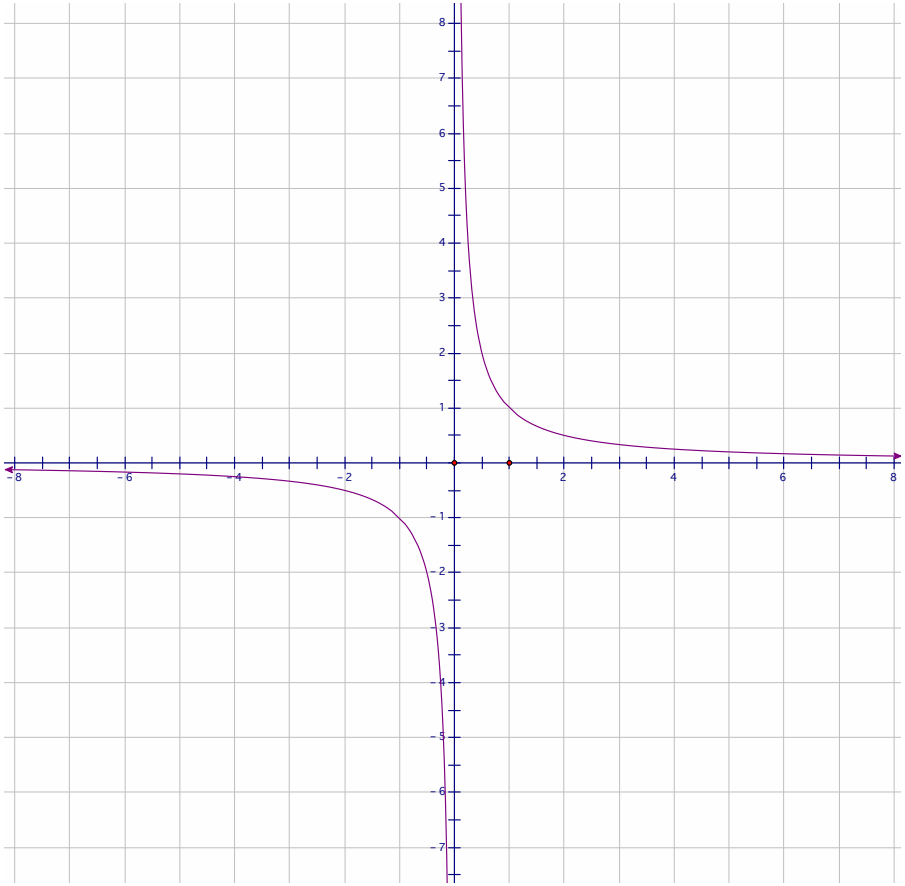
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Name: _____ Date: _____

Maximum Area

1. What's the maximum area of a flowerbed if you have 30 meters of fencing to outline the bed? Predict & confirm.

2. Graph the data.

3. Find an equation that represents the data. Explain why this equation works.

4. Find the maximum area. Explain how you found it. Mark it on the graph.

5. What's the maximum area of a flowerbed if you have 30 meters of fencing but you build it attached to a wall? In other words, you don't have to use fencing on one side. How do you think this will compare to the original maximum and equation. Make a conjecture and explain.

6. Graph the data on the same axes.

7. Find an equation that represents the data. Explain why this equation works. Find and mark the maximum area.

8. How do the equations and maximums compare to the first? Is this a transformation of the previous graph?

9. What's the maximum area of the flowerbed if you have 30 meters of fencing but can use 2 walls? You only have to use the fencing on two sides. How will this equation relate to the first scenario?

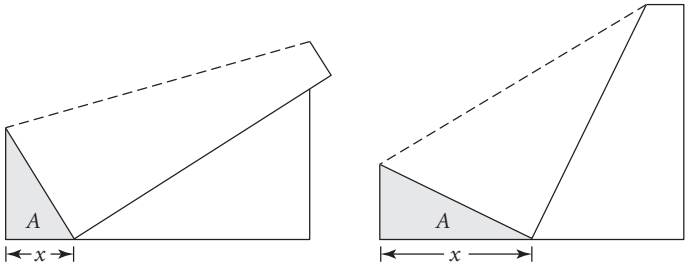
10. Graph the data.

11. Find an equation that represents the data. Explain why this equation works. Find and mark the maximum area.

12. How do these equations and maximums compare? Is this a transformation of one of the previous graphs?

Investigation • The Largest Triangle

Name _____ **Period** _____ **Date** _____



Take a sheet of notebook paper and orient it so that the longest edge is closest to you. Fold the upper-left corner so that it touches some point on the bottom edge. Find the area, *A*, of the triangle formed in the lower-left corner of the paper. What distance, *x*, along the bottom edge of the paper produces the triangle with the greatest area?

Work with your group to find a solution. You may want to use strategies you've learned in several lessons in this chapter. Write a report that explains your solution and your group's strategy for finding the largest triangle. Include any diagrams, tables, or graphs that you used. You might use the sample table and grid provided here.

Distance along bottom (base of triangle) (cm) ***x***	Height of triangle (cm)	Area (cm^2) ***y***