12.1 Relationships Between Dimensions of a Rectangle

TEKS A.1.B, A.1.C, A.11.B; 2A.10.G

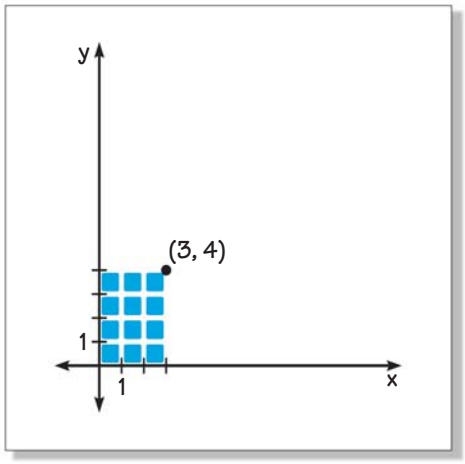
MATERIALS • 12 square tiles

QUESTION Given a rectangle with a fixed area, how is one dimension related to the other?

EXPLORE Graph the relationship between the dimensions of a rectangle

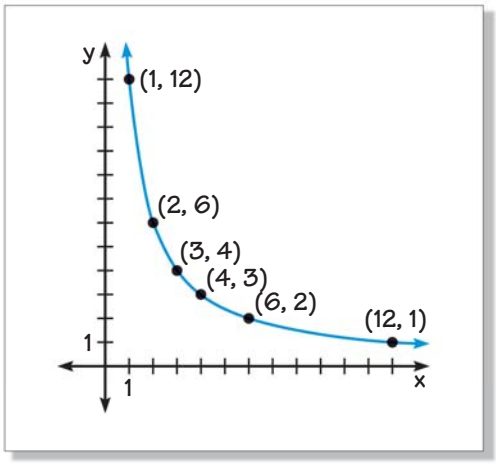
STEP 1 *Form rectangle*

Draw the x- and y-axes on a sheet of paper as shown. Use all of the tiles to form a rectangle in Quadrant I with the lower left vertex on the origin. Then label the upper right vertex with the coordinates (x, y) where x is the horizontal length of the rectangle and y is the vertical length.



STEP 2 *Draw curve*

Repeat Step 1 for all possible rectangles that can be formed with the tiles. Then connect the points by drawing a smooth curve through them.



DRAW CONCLUSIONS Use your observations to complete these exercises

1. *Describe* how the vertical length changes as the horizontal length increases. *Describe* how the vertical length changes as the horizontal length decreases.
2. Does the graph cross the axes? *Explain* your reasoning.
3. Write an equation that gives the vertical length y as a function of the horizontal length x.
4. Let A represent the area of a rectangle. For $A = 40$, write an equation that gives y as a function of x. Then graph the equation.
5. *Compare* the graph of the equation that you wrote in Exercise 4 with the graph of the equation that you wrote in Exercise 3.