Problem – A Square with a Fixed Area

On page 1.3, drag the white point of the slider to change the length and width of the rectangle.

- What is the formula for the area of a rectangle?

- Describe the relationship between the length and the width. How does the width change as the length increases? As the length decreases?

On page 1.4, drag the white point of the segment. Describe the relationship between the length and the width in more detail.

- Do the length and width change at the same rate? In other words, if you change the length by a certain amount, does the width change by the same amount?

Capture at least 10 sets of data from the model on page 1.4. View the data on page 1.6.

- What relationships can you see by examining the **lengthvals** and **widthvals**?

- What is the product of each pair of numbers?

- What is the area of the rectangle?

- Write an equation relating length (*l*) and width (*w*). Then solve it for *w*.

- Do you think this equation represents a function? Explain why or why not.

Plot **lengthvals** vs. **widthvals** on page 1.9.

- Define inverse variation in your own words.

Inverse Variation

On page 1.12, move the white point of the slider to change the rectangle.

- What do you notice about the point marked X as you slide the slider?

- Draw the locus of point X as the white point travels along the slider. What do you notice?

On page 1.15, graph the equation you solved for *w* in **f1**. Substitute *x* for *l*.

- What other information can you find from the graph of your equation that you could not gather from the plot? Does this graph appear to be a function?

- What appears to be happening when $x = 0$?

- What quadrants does the graph of your equation not appear in? Why? Do you think an inverse variation can ever be found those quadrants?

View a table of values for the graph.

- What is happening when $x = 0$? Why?

- Arrow to negative values for *x* in the table. What do you notice about the *y*-values? Why does this occur?