



Math Tips: Perfect Squares

Key Terms:

Factors: Whole numbers that have been multiplied together to create a new number, the **product**.

Product: The result when you multiply two whole numbers by each other.

Perfect Square: The number we get when we multiply any whole number by itself. The **square root** is the number being multiplied by itself. For example, $5 \times 5 = 25$. In this case, **25** is the **perfect square** and **5** is the **square root of 25**.

The Math behind the Mystery

As you find out in Writing on the Wall, you can shape the same length of line into different rectangles with different areas! And here's a cool fact: the biggest rectangular area it can surround will always be a perfect square. **Here's why:**

If you have 20 feet of line, half of that will run along the bottom and left side, and half will form the top and right:



So $W + L$ have to add up to 10. And the width *times* the length, $W \times L$, will give you the area. As you see here, the pairs all add up to 10 BUT multiply out to different areas:

Width	Length	Area
1	9	9
2	8	16
3	7	21
4	6	24
5	5	25

...and the rest of the possible pairs are just these in reverse order, but with the same result.