Math Lab: Investigating a Difference of Squares

Procedure

Step 1: Take graph paper and cut out a square that is 10 units by 10 units.

How many square units occupy the 10 × 10 square?

Step 2: From one corner of the 10 × 10 square, cut out a square that has dimensions 6 × 6.

How many square units occupy the 6 × 6 square?

Step 3: Remove the 6 × 6 square, and determine the area that remains.

Step 4: Cut along one line of the remaining L-shaped piece to obtain two rectangles.

Step 5: Arrange the two rectangles into the shape of a larger rectangle.

What is the length and what is the width of this new rectangle?

How can you express the length and width of this rectangle using the dimensions of the original square and the removed square?

Step 6: Repeat steps 1 to 5 with squares of different dimensions indicated in the table. The first row is completed as an example.

Dimensions of Original Square	Dimensions of Removed Square	Rectangle Length	Rectangle Width	Rectangle Area
10 × 10	6 × 6	16	4	64
8 × 8	3 × 3			
7 × 7	4 × 4			
5 × 5	2 × 2			

Analysis

1. How can you express the length of the new rectangle in terms of the dimensions of the original square and the removed square?

2. How can you express the width of the new rectangle in terms of the dimensions of the original square and the removed square?

3. Using the patterns you have discovered in this Math Lab, explain how you could determine the area remaining in each case.

Dimensions of Original Square	Dimensions of Removed Square
20 × 20	11 × 11
55 × 55	15 × 15