Flip-Chip Algebra:
Using the Extension Kit

Introduction

This handout is intended as a short demonstration of the possible uses of the Extension Kit. For a complete Introductory Algebra course using manipulatives, see ***Flip-Chip Algebra*** (567 pages). For a shorter course, see ***Flip-Chip Essentials*** (194 pages).

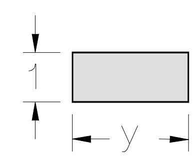
The extension kit is useful for illustrating concepts from geometry and intermediate algebra. These manipulatives are not illustrated in the above text but are used in a similar manner. The illustrations use some manipulatives from the Basic Kit.

For more information, contact Flip-Chip Enterprises, 428 NW Rogers Street, Olympia WA 98502. You can also reach us by phone at (360) 943-4535.

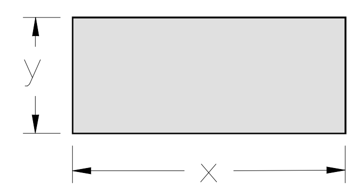
Manipulative Pieces

Contents:

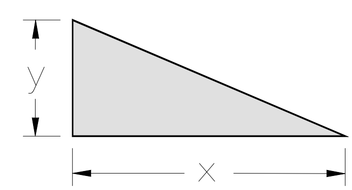
- 6 xy rectangles
- 6 y^2 squares
- 1 $(x-y)^2$ square
- 4 xy right triangles



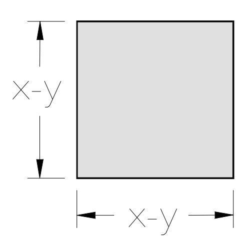
y rectangle



xy rectangle



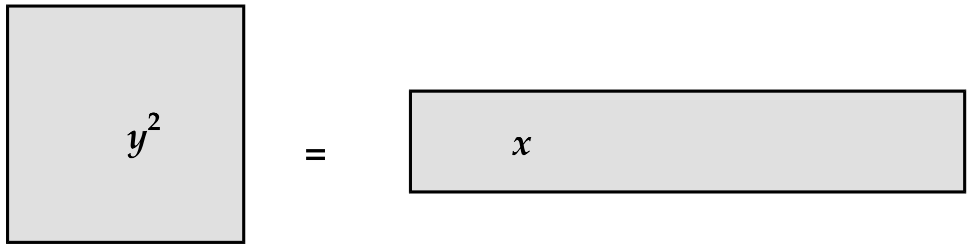
xy right triangle



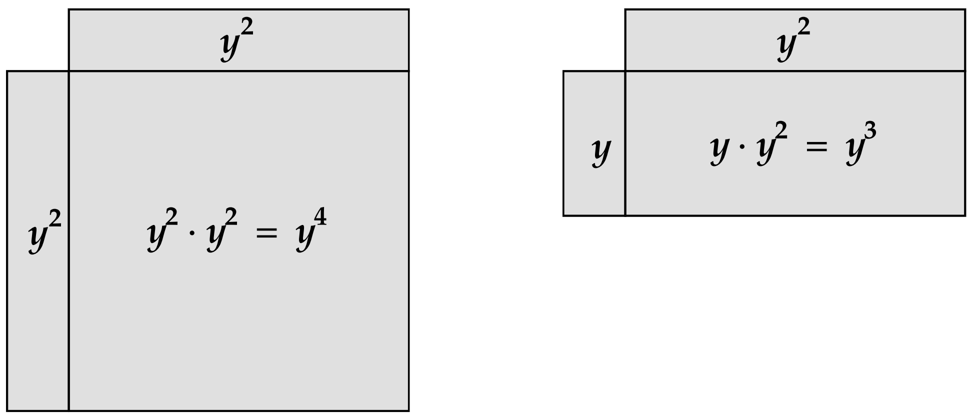
$(x-y)^2$ square

Alternate Dimensions

The x bar is the same area as the y^2 piece.

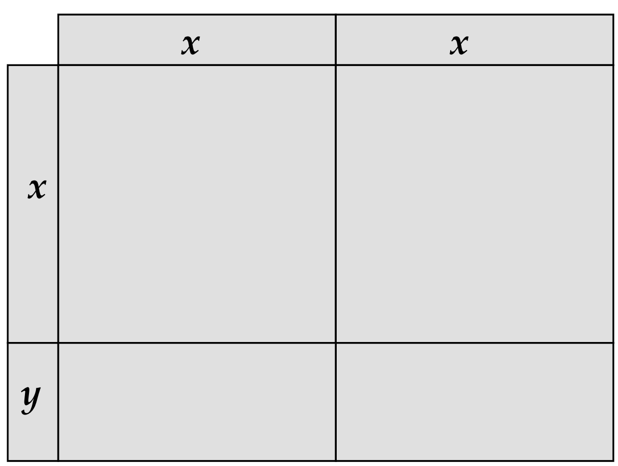


You can represent third and fourth powers of y by using the x bar.



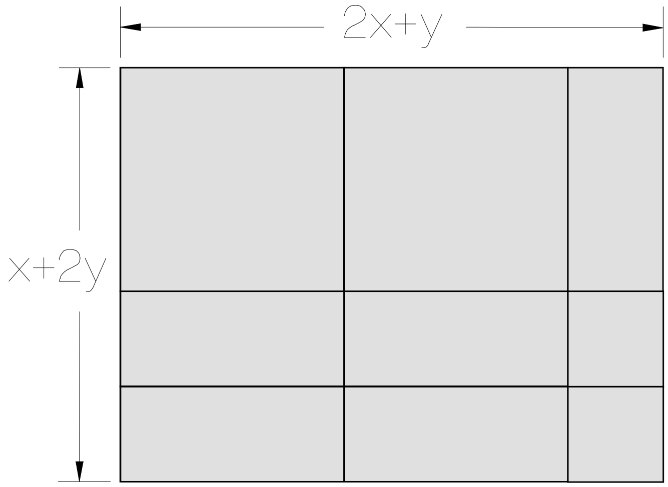
Multiplying Polynomials with Two Variables

$$(x + y)(2x) = 2x^2 + 2xy$$

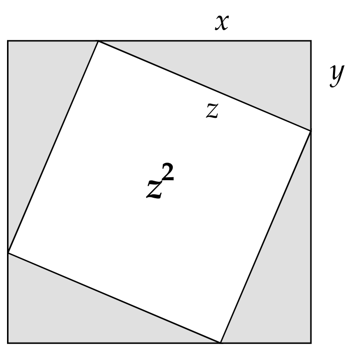


Factoring Polynomials

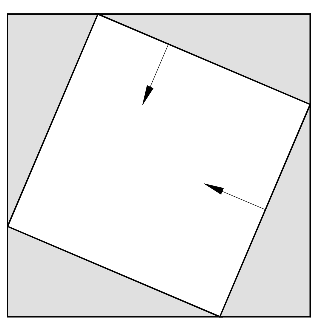
$$2x^2 + 2y^2 + 5xy = (2x + y)(x + 2y)$$



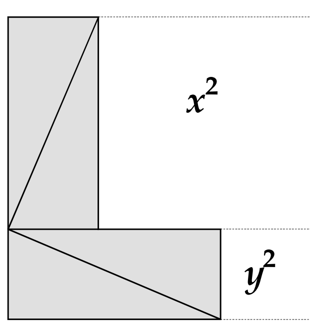
Pythagorean Theorem: Proof 1



Empty space = z^2



Move 2 triangles



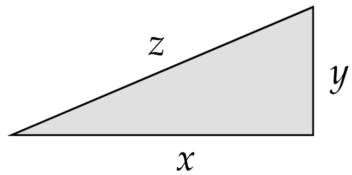
Now empty space is $(x^2 + y^2)$

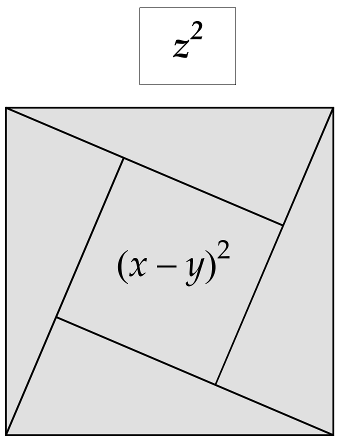
So $z^2 = x^2 + y^2$

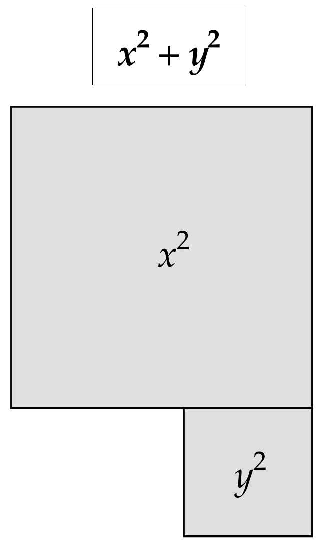
Start with 4 triangles and the $(x - y)^2$.

They fit together to make z^2.

Put down an x^2 and a y^2.







Rearrange the pieces that formed z^2

so that they exactly cover $x^2 + y^2$.

Therefore $z^2 = x^2 + y^2$