What is an Alge-Tile? (collecting "like" terms)

Learning Goal:

By the end of today, we will be able to recognize "like" and "unlike" terms.

By the end of today, we will be able to "collect" like terms to simplify an algebraic expression.

Mar 30-9:23 AM

What is an Alge-Tile? And what can it be used for?

Part One

An alge-tile can be used as a two colour counter to illustrate such things as:

- used to illustrate the ZERO Principle
- adding/subtracting integers

Part Two

An alge-tile can be used to represent the collection of "like" and "unlike" terms

Part Three

An alge-tile can be used with a multiplication array to create an AREA MODEL that can be used to illustrate the following:

- the Distributive Property
- Common Factoring
- Factoring of Trinomials
- Factoring of a Differnce of Squares
- Illustrate Completing the Square

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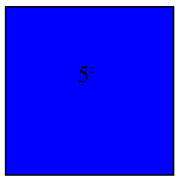
Defining Alge-Tiles

Reviewing Area calculations with "unknowns"

Calculate the area of a 5 x 5 square

5

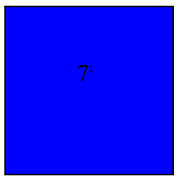


5

$A = (5)(5)$
$= 5^2$
$= 25$

Calculate the area of a 7 x 7 square

7



7

$A = (7)(7)$
$= 7^2$
$= 49$

Calculate the area of a 1 x 1 square

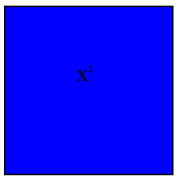
1

1

$A = (1)(1)$
$= 1^2$
$= 1$

Calculate the area of a square with side length "x"

x



x

$A = (x)(x)$
$= x^2$

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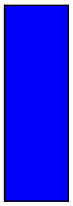
Defining Alge-tiles

Reviewing Area calculations with "unknowns"

Calculate the area of a 5 x 1 rectangle



5

1

$A = (5)(1)$
$= 5$

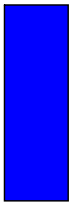
Calculate the area of a 7 x 1 rectangle

7

1

$A = (7)(1)$
$= 7$

Calculate the area of a rectangle with side length "x" and side length 1



x

1

$A = (x)(1)$
$= x$

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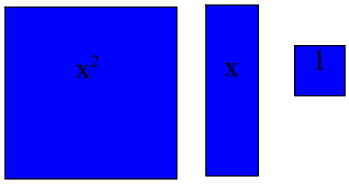
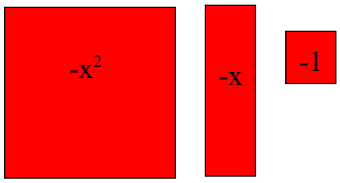
Defining Alge-tiles

Alge-Tile Pieces we will be using, both positive and negative

Positive Alge-Tiles



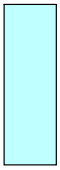
Negative Alge-Tiles



The ZERO Principle still applies to Alge-Tiles, a positive and negative of the same value (size) cancel each out.

NOTE: different textbooks use a reverse colour scheme - it doesn't matter as long as you are consistent throughout the problem.

Other terms can be represented by pictures, see below.



A = (x)(y)
= xy

This term would be called an "xy" term, within a problem shapes would only have one value.

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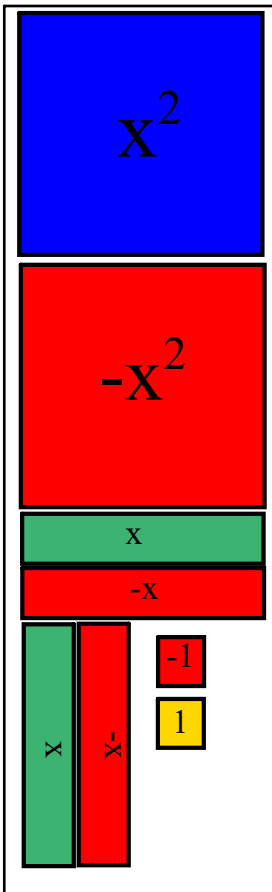

Polynomial Definitions

Monomial - "ONE Term" - consisting of a *constant*, an unknown, or a constant and unknown multiplied together

ie. 5 ie. 4x ie. $-2x^2$

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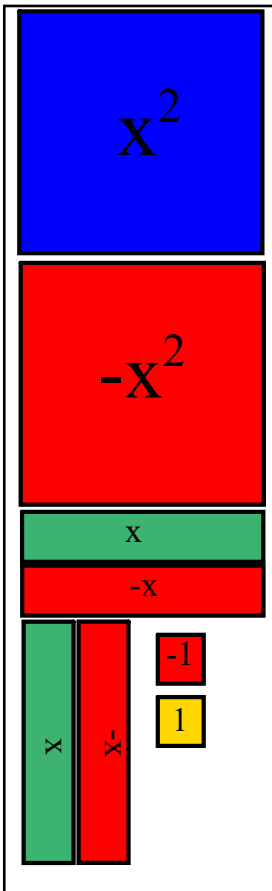

Binomial - "Two Terms" - consisting of a constant and an unknown, or two unknowns separated by the addition or subtraction operation

ie. $x + 5$ ie. $2x - 6$

ie. $-3x^2 + 4x$

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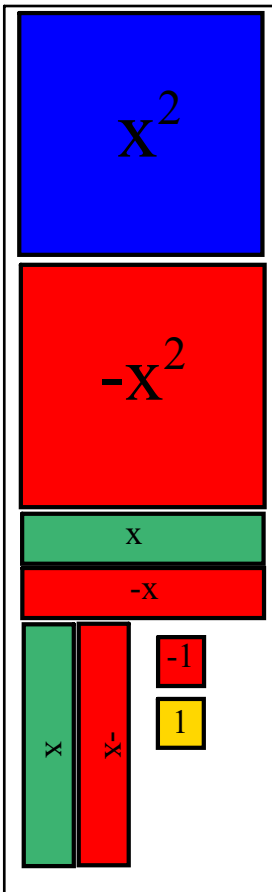

Trinomial - "Three Terms" - consisting of a constants and unknowns separated by the addition or subtraction operation

ie. $x^2 - 2x + 5$

ie. $-2x^2 + 3x - 1$

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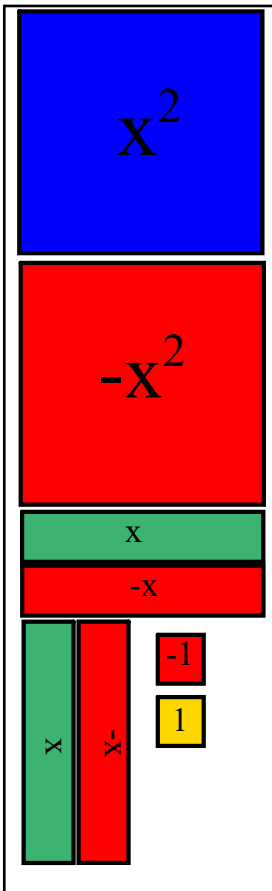

Alge-Tiles and Collecting "Like Terms"

"Like" Terms will be represented by pieces of the same SIZE

Simplify

$3x + 4x =$

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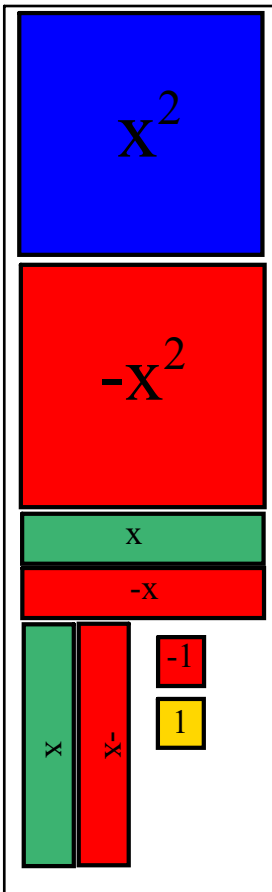

Alge-Tiles and Collecting "Like Terms"

"Like" Terms will be represented by pieces of the same SIZE

Simplify

$2x + 3x - 4 =$

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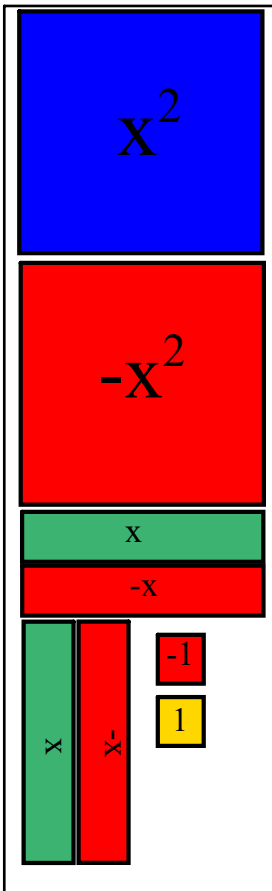

Alge-Tiles and Collecting "Like Terms"

"Like" Terms will be represented by pieces of the same SIZE

Simplify

$3x^2 + 5x - 2 - 2x^2 - 3x + 5$

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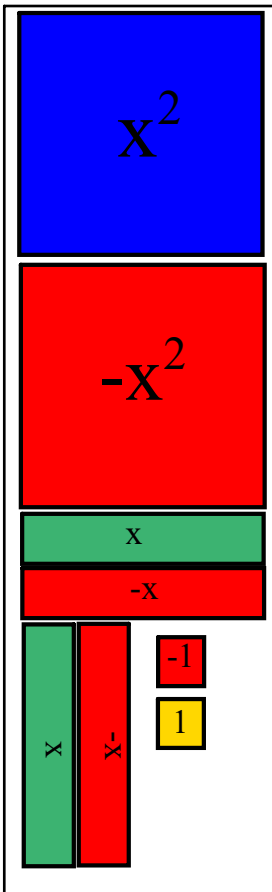

Alge-Tiles and Collecting "Like Terms"

Simplify

$2x^2 + 3x - 7 - 4x^2 - 1x + 3$

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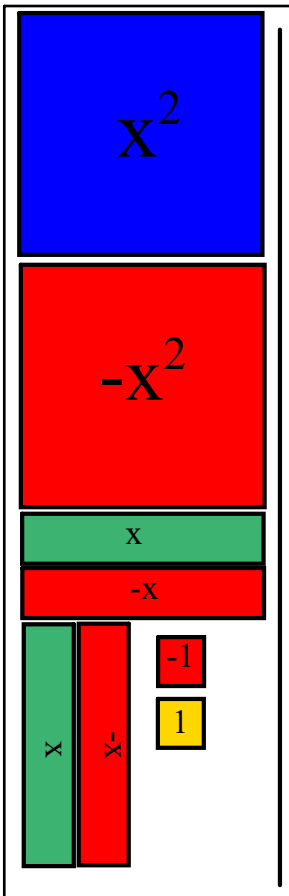
"Like" Terms must have the exact same variables after the coefficient (same shape algetiles), although the order does not matter.

Notice, when adding or subtracting, the exponents DO NOT CHANGE.

Like Terms	Unlike Terms
4a, 5a	4a, 5c
6ab, 7ab, -9ba	$6a^2b$, $7ab^2$, $-9ba^3$
$8x^2y$, $2x^2y$	$8x^2y^2$, $2x^2y$



Alge-Tiles and Collecting "Like Terms"

Simplify

$(3x + 1) + (2x - 5)$

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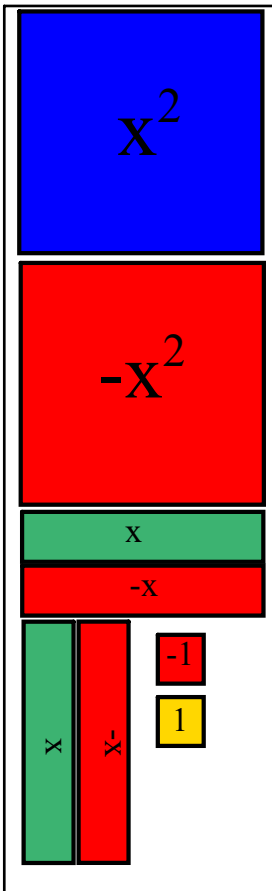

Alge-Tiles and Collecting "Like Terms"

Simplify

$(x^2 + 3x + 1) + (2x^2 - 4x - 3)$

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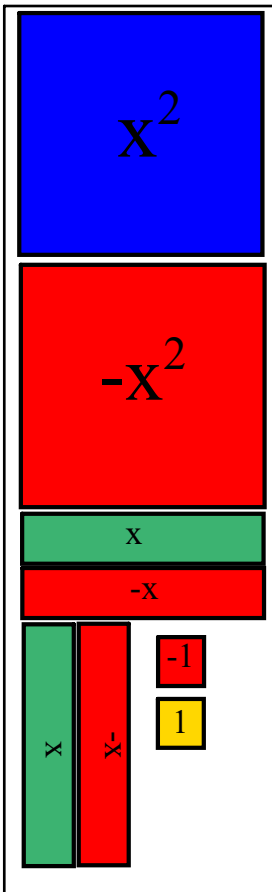

Alge-Tiles and Collecting "Like Terms"

Simplify

(3) - (5)

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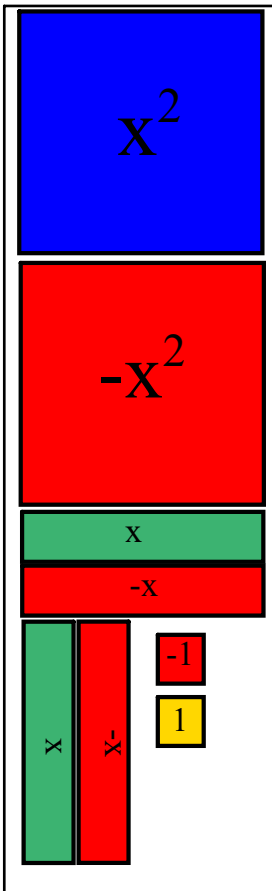

Alge-Tiles and Collecting "Like Terms"

Simplify

$(2x + 5) - (x + 3)$

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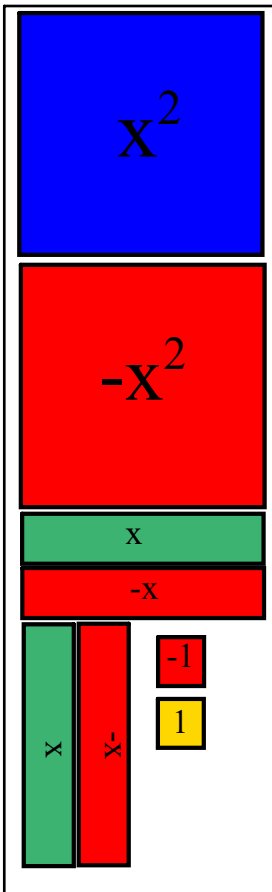

Alge-Tiles and Collecting "Like Terms"

Simplify

$(3x - 2) - (x + 3)$

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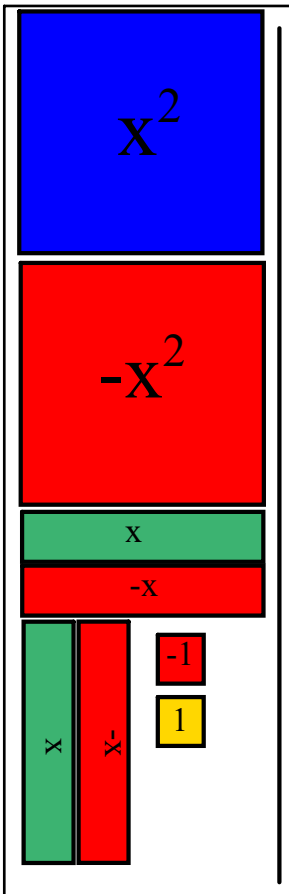

Alge-Tiles and Collecting "Like Terms"

Simplify

$(x^2 + 4x - 3) - (2x^2 + 3x - 5)$

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Consolidation Questions:

pg 109-110

#1,3,5 (a-c),6,8

Sep 23-9:20 PM