Using Algebra Tiles

You Can "Feel" *the Mathematics*

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TEKS & Algebra Tiles

Grade 7: 7.1(C), 7.2(C), 7.5A

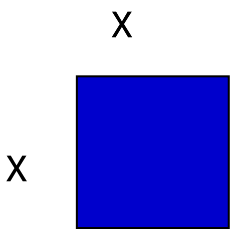
Grade 8: 8.14

Algebra I: A.4, A.10, C.3(B), C.4(B), D.2(A)

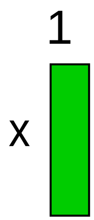
Algebra II: C.2(E)

3 Tiles

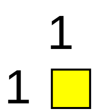
- Each tile represents an area.



Area of large square = x (x) = x^2

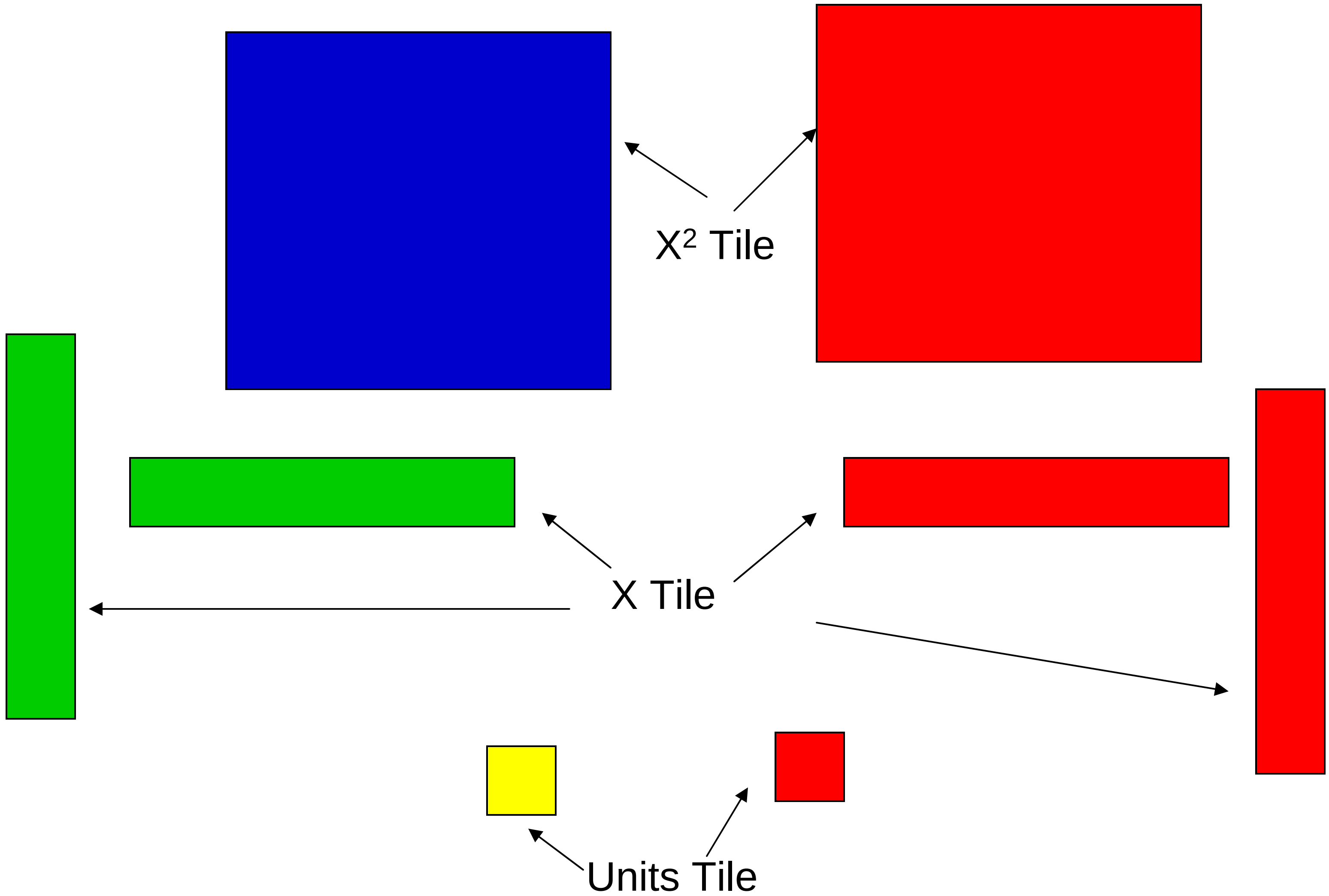


Area of rectangle = 1 (x) = x

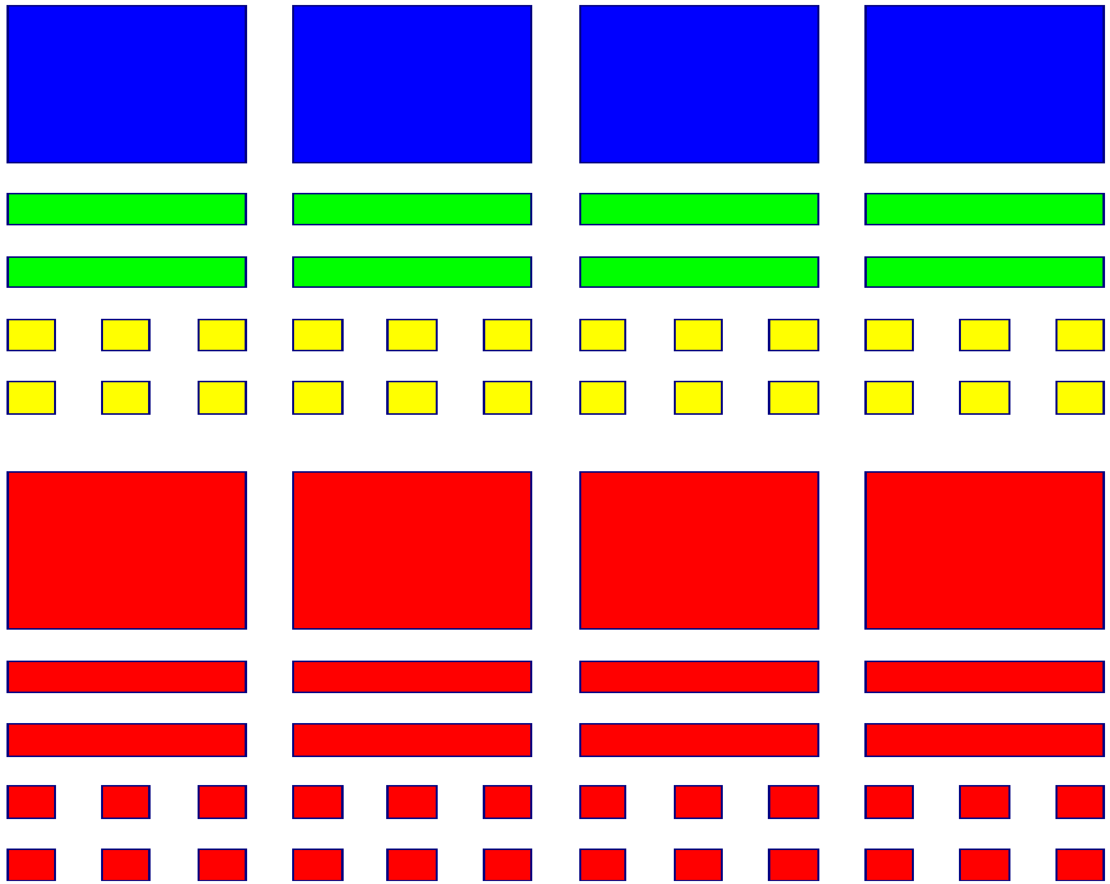


Area of small square = 1 (1) = 1

POSITIVE ALGEBRA TILES **NEGATIVE ALGEBRA TILES**



Algebra Tiles Template

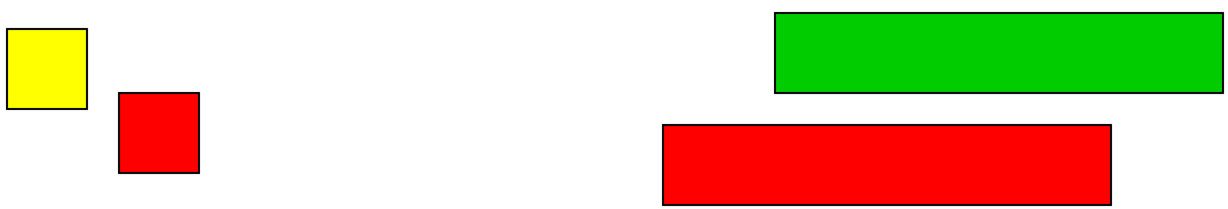


Big Ideas Using Algebra Tiles

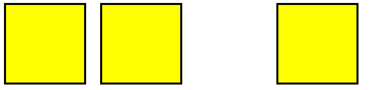
- A & S Integers; Zero Principle
- Modeling Linear Expressions
- Solving Linear Equations
- Simplifying Polynomials
- Solving Equations for Unknown Variable
- M & D Polynomials
- Completing the Square
- Investigations

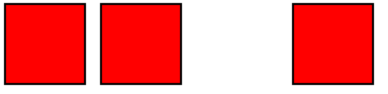
Additive Inverses

- A combined negative and positive tile of the same area produces a zero pair.



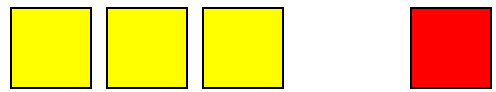
Use Algebra Tiles to Model Integer Addition

2 + 1 = 

-2 + -1 = 

Use Algebra Tiles to Model Integer Addition

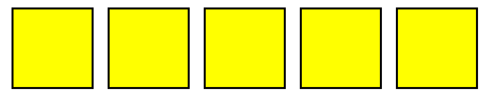
3 + -1 =



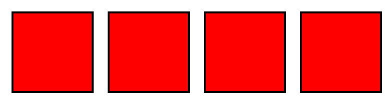
3 + -3 =

Use Algebra Tiles to Model Integer Subtraction

5 – 2 =

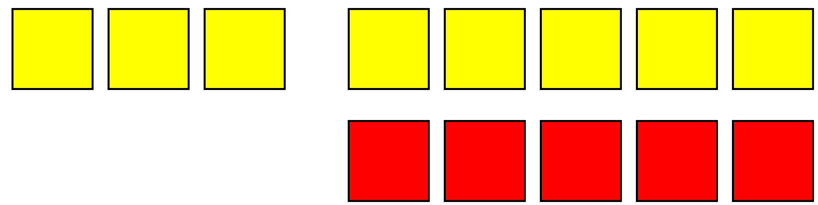


-4 – (-3) =

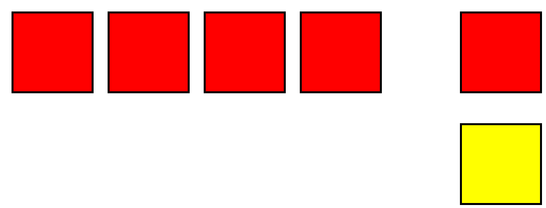


Use Algebra Tiles to Model Integer Subtraction

3 – (-5)



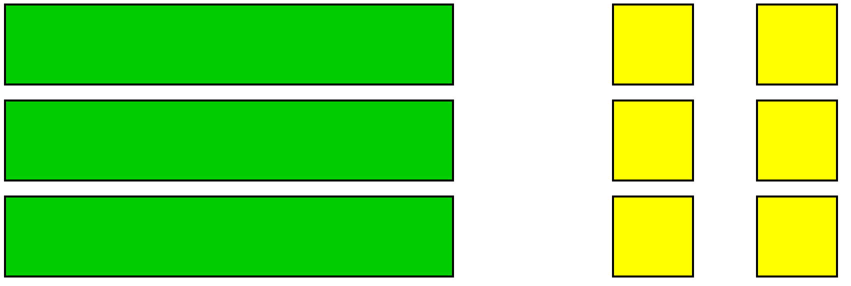
-4 – 1



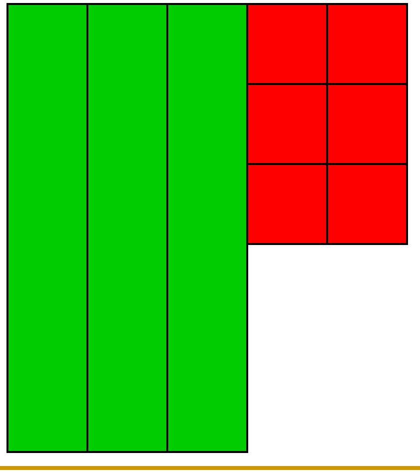
MODELING LINEAR EXPRESSIONS

Grouping with Algebra Tiles

- Ex: 3x means 3 rows of x



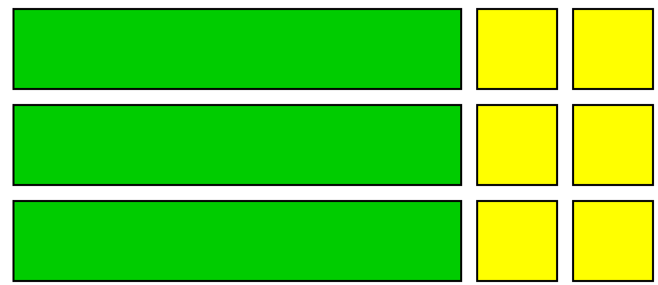
- 3x - 6 means 3 rows of x and 6 negative units



**Try representing $2x^2$ + X - 3

Distributive Property

$3(X + 2)$



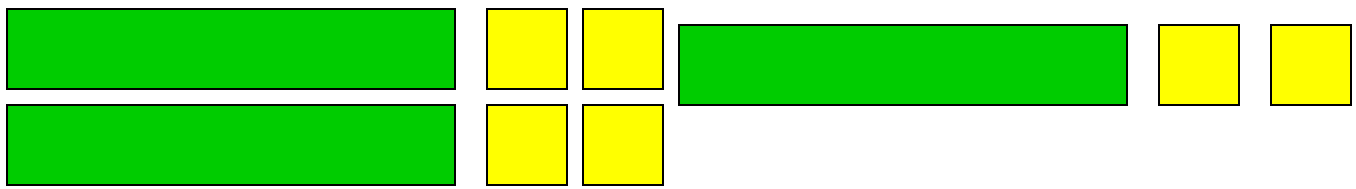
$3(X – 4)$

$-2(X + 2)$

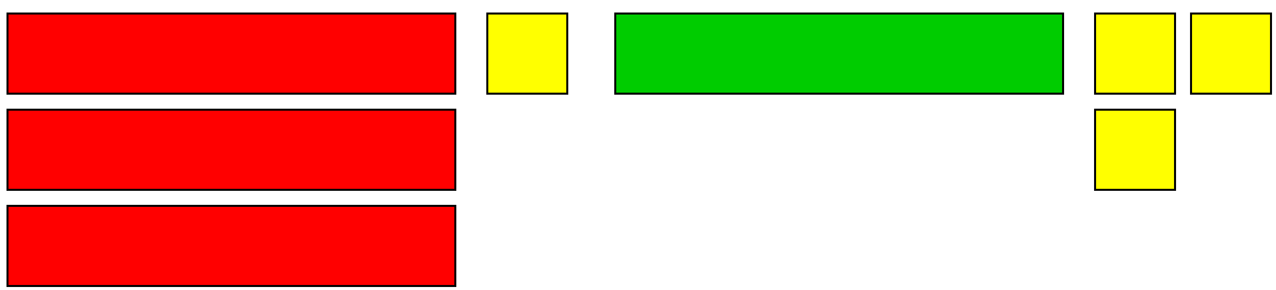
$-3(X – 2)$

Simplifying Polynomials

Simplify 2x + 4 + x + 2.



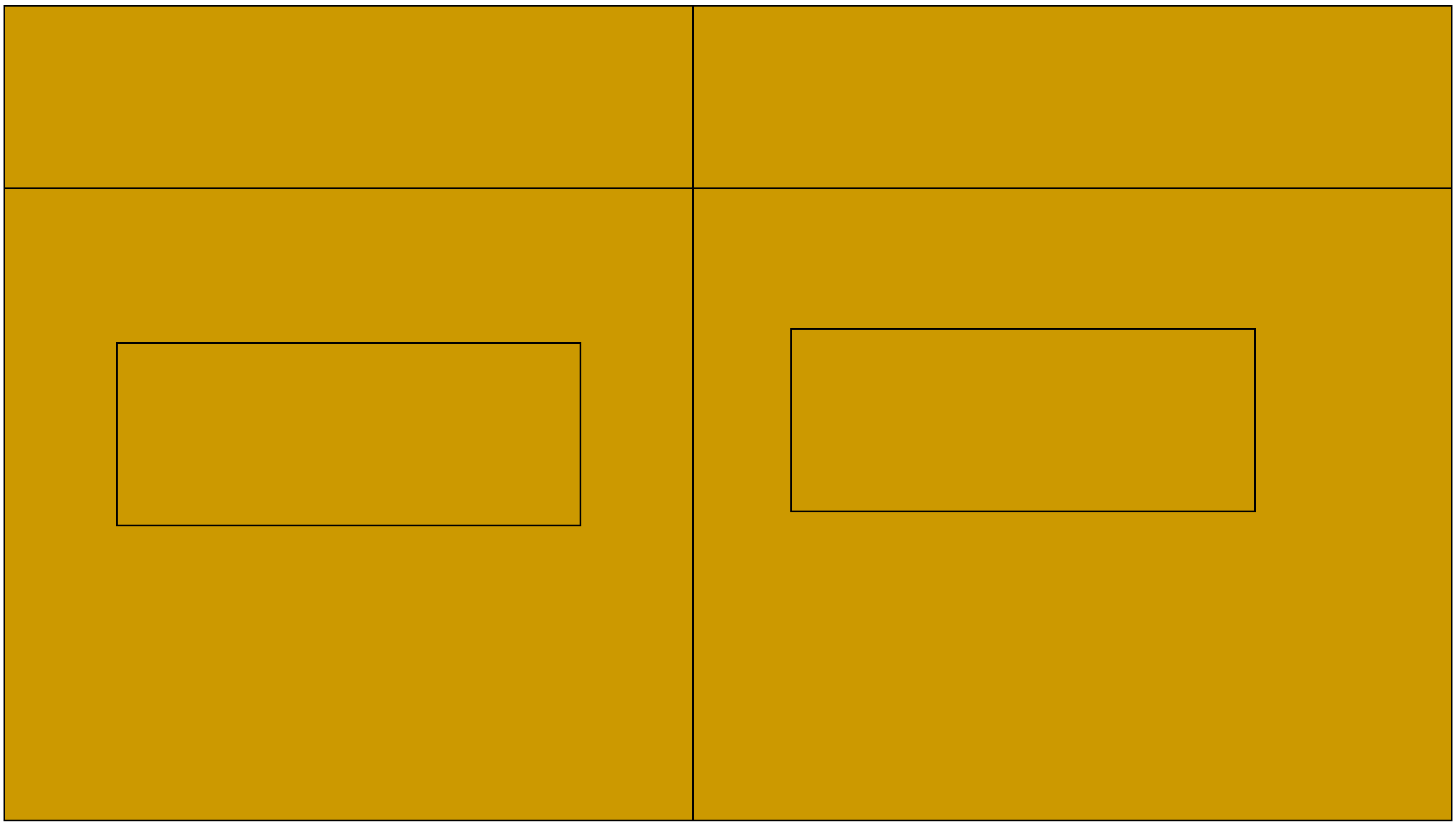
Simplify -3x + 1 + x + 3.



Simplify $(2x^2 – 2x + 3) – (3x^2 + 3x – 2)$.

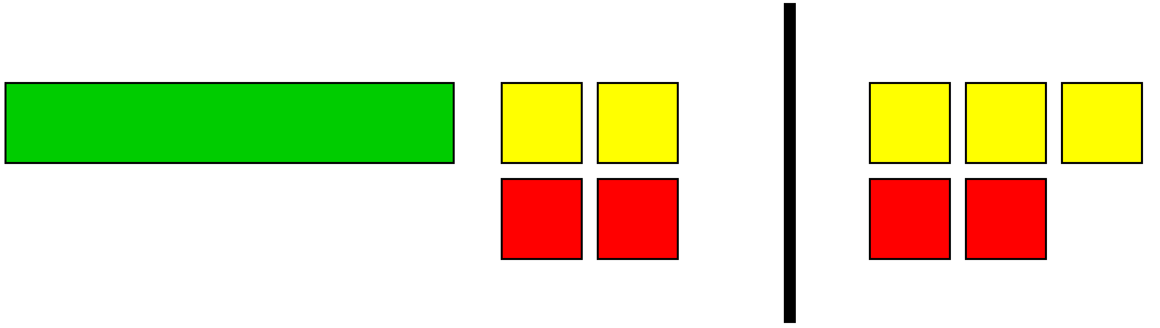
SOLVING EQUATIONS

Use Algebra Mats to Solve Equations



Use algebra tiles to find value of X.

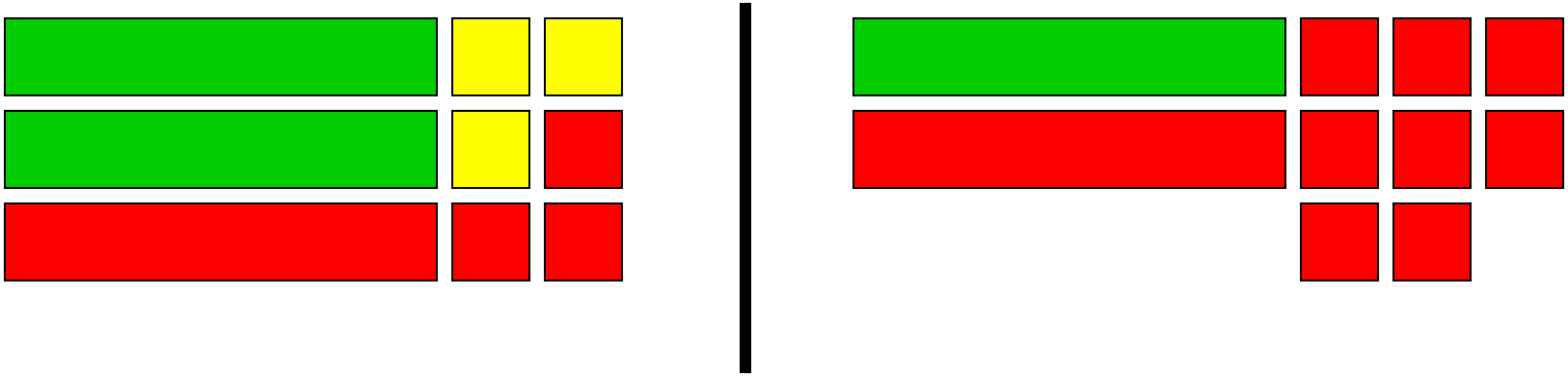
X + 2 = 3



Try 2X – 4 = 8.

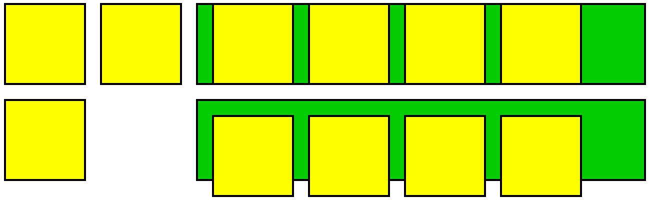
Use algebra tiles to find value of X.

2X + 3 = X – 5



Substitution

Evaluate 3 + 2x   if x = 4

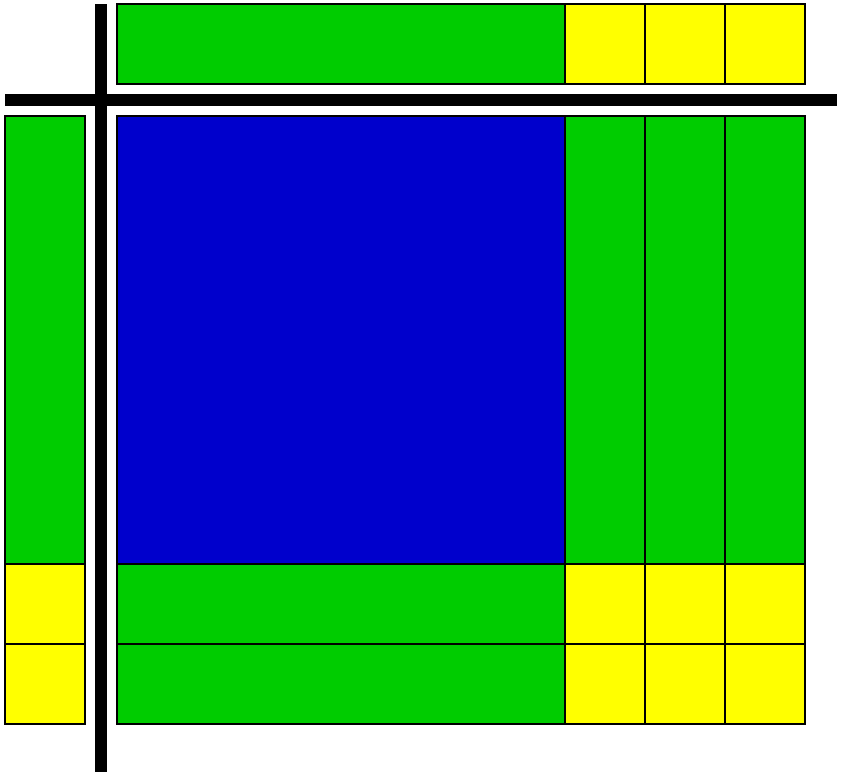


Evaluate 3 - 2x   if x = -4

MULTIPLYING POLYNOMIALS

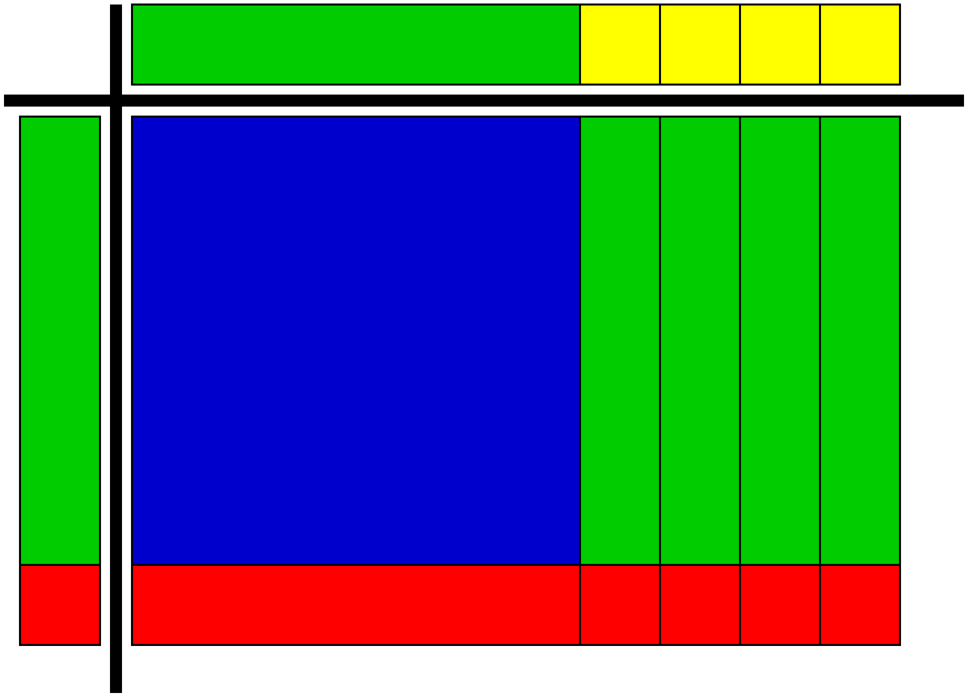
Multiplying Polynomials

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



Multiplying Polynomials

$(x - 1)(x + 4)$



Multiplying Polynomials

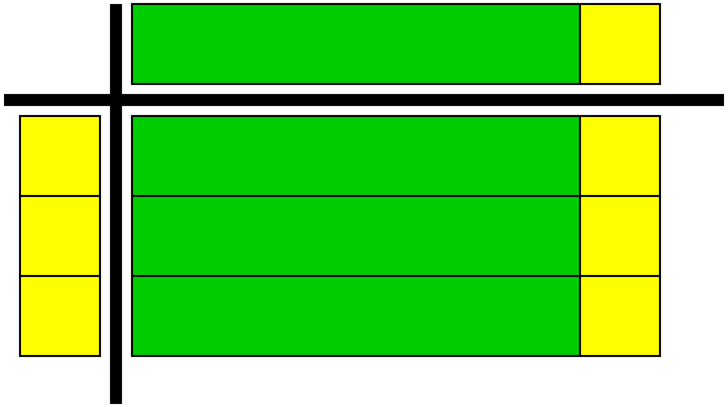
$(x + 2)(x – 3)$

$(x – 2)(x – 3)$

FACTORING POLYNOMIALS

Factoring Polynomials

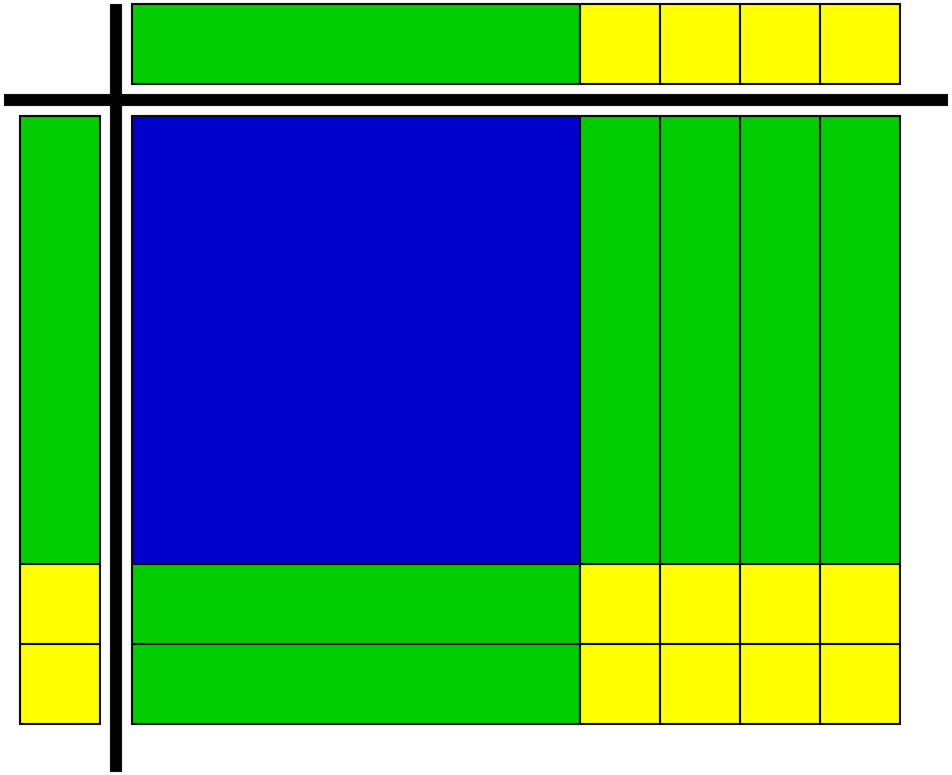
3x + 3



2x – 6

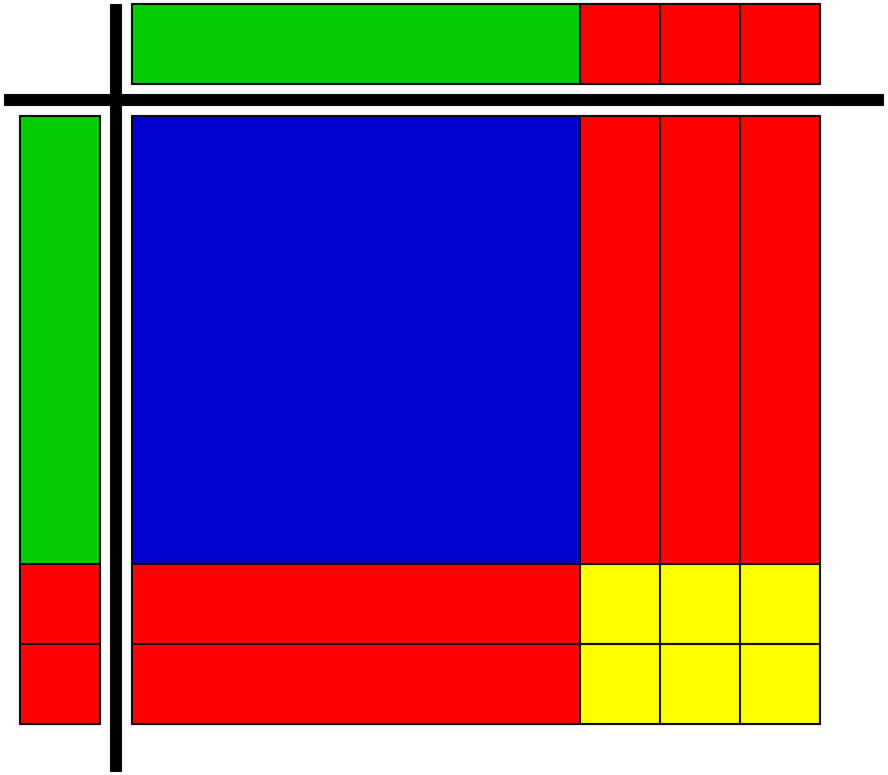
Factoring Polynomials

$x^2 + 6x + 8$



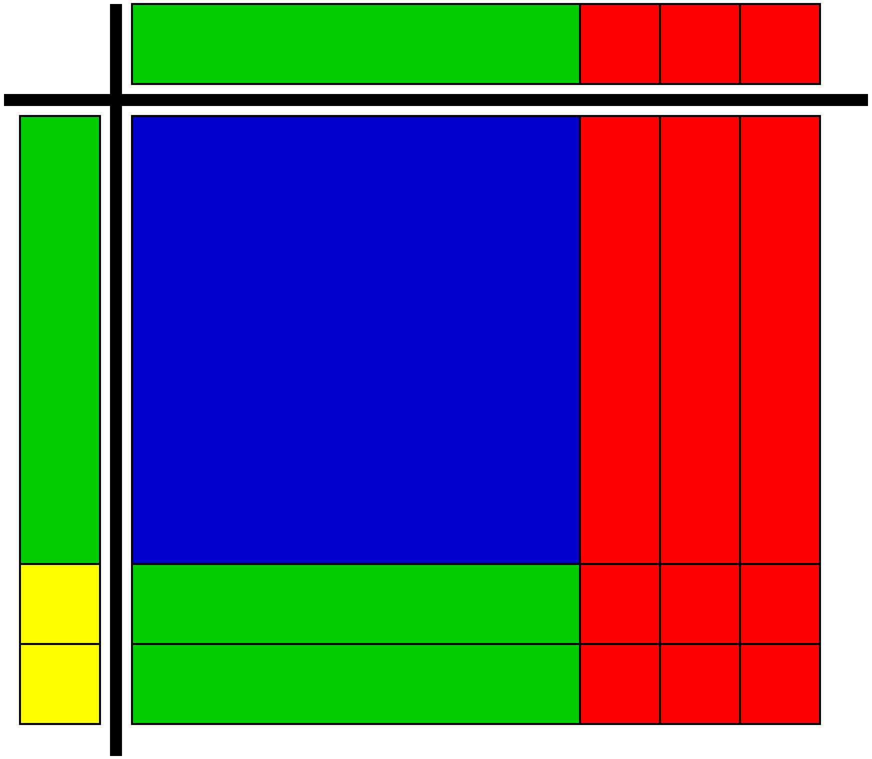
Factoring Polynomials

$x^2 - 5x + 6$



Factoring Polynomials

$x^2 – x – 6$



Factoring Polynomials

$x^2 + x - 6$

$x^2 - 1$

$x^2 - 4$

$2x^2 - 3x - 2$

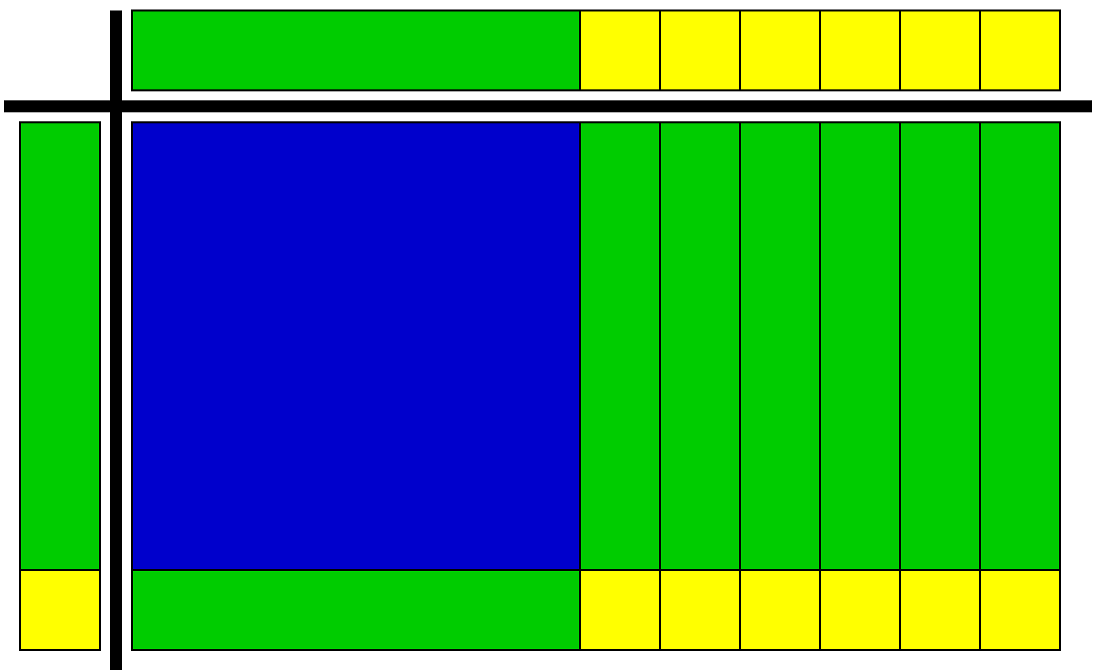
$2x^2 + 3x - 3$

$-2x^2 + x + 6$

DIVIDING POLYNOMIALS

Dividing Polynomials

$$\frac{x^2 + 7x + 6}{x + 1}$$



Dividing Polynomials

$$\frac{x^2 + 7x + 6}{x + 1}$$

$$\frac{2x^2 + 5x - 3}{x + 3}$$

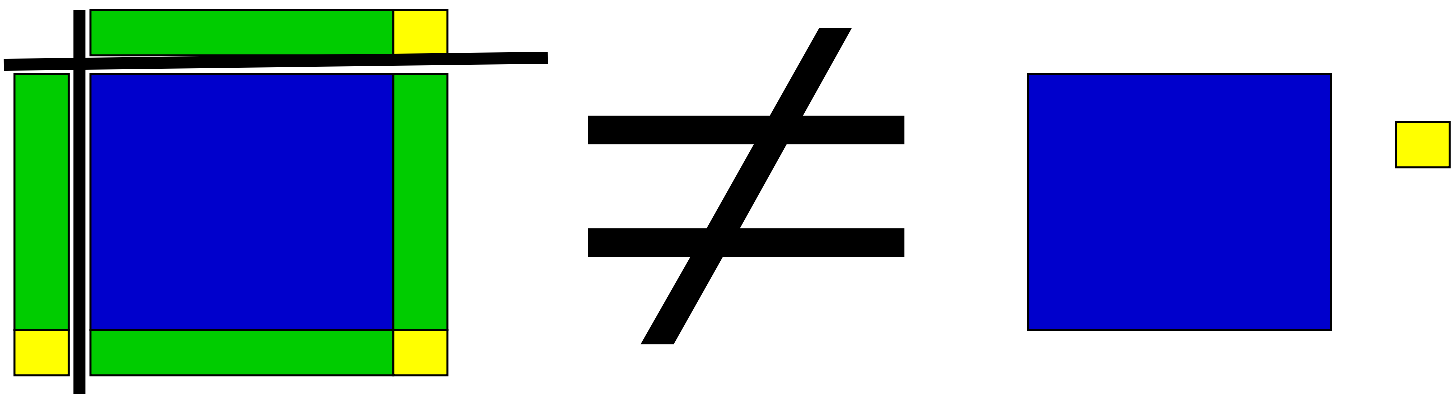
$$\frac{x^2 - x - 2}{x - 2}$$

$$\frac{x^2 + x - 6}{x + 3}$$

INVESTIGATIONS

Investigations with Algebra Tiles

- Use algebra tiles to show that $(x + 1)^2$ and $(x^2 + 1)$ are not equivalent.



$$(x + 1)^2 = (x+1)(x+1) = x^2 + 2x + 1$$

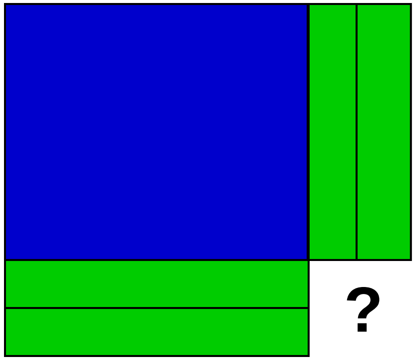
$$x^2 + 1$$

COMPLETING THE SQUARE

Using Algebra Tiles to Complete Square

- What is needed to create a perfect square trinomial for $x^2 + 4x + \square$?

- Use algebra tiles to create a square. What tiles will be needed to complete the square?



Completing the Square

- What is needed to create a perfect square trinomial for x^2 - 6x + $\square$?