

What's Going On?

Checking In

Minds on

What's the Pattern?

Action!

Factoring without Algebra Tiles

Consolidation

Extreme Collaboration

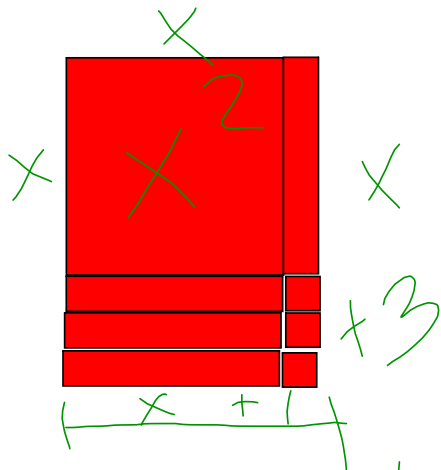
Learning Goal - I will be able to factor standard form equations using algebra tiles.

Checking In

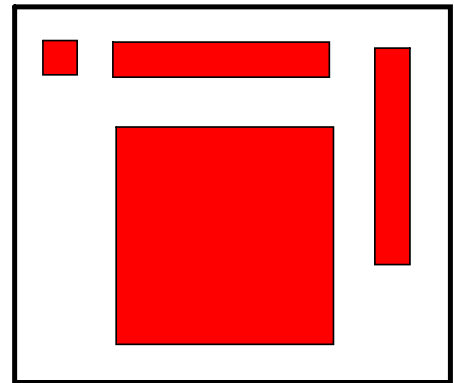
Test this Friday!
Then... last unit!

Please RAFT or get caught up
until 10:30

$$y = \overset{a}{x^2} + \overset{b}{4x} + 3$$



$$y = (x+1)(x+3)$$



Minds on

What's the Pattern?

| Standard Form | Factored Form | b | c | -r | -s |
|---------------------|------------------|---|----|----|----|
| $y = x^2 + 5x + 6$ | $y = (x+3)(x+2)$ | 5 | 6 | 3 | 2 |
| $y = x^2 + 3x + 2$ | $y = (x+2)(x+1)$ | 3 | 2 | 2 | 1 |
| $y = x^2 + 6x + 9$ | $y = (x+3)(x+3)$ | 6 | 9 | 3 | 3 |
| $y = x^2 + 6x + 8$ | $y = (x+4)(x+2)$ | 6 | 8 | 4 | 2 |
| $y = x^2 + 6x + 5$ | $y = (x+1)(x+5)$ | 6 | 5 | 1 | 5 |
| $y = x^2 + 4x + 3$ | $y = (x+3)(x+1)$ | 4 | 3 | 3 | 1 |
| $y = x^2 + 7x + 10$ | $y = (x+2)(x+5)$ | 7 | 10 | 2 | 5 |
| $y = x^2 + 7x + 12$ | $y = (x+3)(x+4)$ | 7 | 12 | 3 | 4 |
| $y = x^2 + 8x + 15$ | $y = (x+3)(x+5)$ | 8 | 15 | 3 | 5 |
| $y = x^2 + 7x + 6$ | $y = (x+6)(x+1)$ | 7 | 6 | 6 | 1 |
| $y = x^2 + 4x + 4$ | $y = (x+2)(x+2)$ | 4 | 4 | 2 | 2 |
| $y = x^2 + 8x + 16$ | $y = (x+4)(x+4)$ | 8 | 16 | 4 | 4 |

Action!

Factoring without Algebra Tiles

When we are given a quadratic equation in standard form, we can put it into factored form by **factoring!**

$$\begin{array}{c} \text{Standard Form} \\ \hline y = x^2 + 5x + 4 \end{array} \dots \rightarrow \begin{array}{c} \text{Factored Form} \\ \hline y = (x + 4)(x + 1) \end{array}$$

BUT HOW??

We need to find two numbers (factors) that

- add to 5
- multiply to 4

Action!

Finding Factors

$$y = x^2 + 5x + 4$$

We need to find two numbers (factors) that

- add to 5
- multiply to 4

Factors of 4

| | sum | |
|-------|------|----------|
| +1 +4 | +5 ✓ | <u>1</u> |
| +2 +2 | +4 ✗ | |

$$y = (x + 1)(x + 4)$$

$$Y = X^2 + \underline{17X} + \underline{30}$$

Two numbers that

→ add to +17

→ multiply to +30

Factors of (30)

+1 +30; 31 X

+2 +15; 17 ✓

+3 ;

+4 ;

+5 ;

$$Y = (X + 2)(X + 15)$$

Action!

Finding Factors

$$y = x^2 + 8x - 20$$

We need to find two numbers (factors) that

larger is (+)

(combine) - add to +8 (b)

- multiply to -20 (c)

Factors of -20

1 20 X

-2 +10 ✓

$$y = (x - 2)(x + 10)$$

$$Y = x^2 + 7x - 18$$

Two numbers that
multiply to -18
add to 7

One is $(+)$, one is $(-)$
the bigger is $(+)$

Factors of -18

| | | | | |
|------|-------|-------|--------------|----------------|
| -1 | $+18$ | $+17$ | \times | frown |
| -2 | $+9$ | $+7$ | \checkmark | smile |

$$Y = (x - 2)(x + 9)$$

Action!

Finding Factors

$$y = x^2 - 2x - 24$$

We need to find two numbers (factors) that

- add to -2

- multiply to -24

One \oplus one \ominus

Bigger is \ominus

Action!

Finding Factors

$$y = x^2 - 9x + 18$$

We need to find two numbers (factors) that

- add to _____

- multiply to _____

 Consolidation

Practice

Consolidation

Extreme Collaboration