

## What's Going On?

**Checking In**

Quick Quiz

**Minds on**

Factoring by Grouping Review

**Action!**

What's the Pattern?

**Consolidation**

It's easy as ***a b.t5***

**Learning Goal - I will be able to factor trinomials in the form  
 $x^2 + bx + c$ .**

**Minds on**

# Factoring by Grouping Review

$$6x^2 - 8x + 3xy - 4y$$

1. Group terms that have a common factor.

$$6x^2 - 8x + 3xy - 4y$$

$$6x^2 + 3xy - 8x - 4y$$

$$6x^2 - 4y - 8x + 3xy$$

## Minds on

# Factoring by Grouping Review

$$6x^2 - 8x + 3xy - 4y$$

2. Common Monomial Factor each pair of terms.

$$\boxed{6x^2 - 8x} + \boxed{3xy - 4y}$$

$$= 2x(3x - 4) + y(3x - 4)$$

Binomial Common  
Factor

$$\boxed{6x^2 + 3xy} - \boxed{8x - 4y}$$

$$= 3x(2x + y) + 4(-2x - y)$$

close!

$$\boxed{6x^2 - 4y} - \boxed{8x + 3xy}$$

$$= 2(3x^2 - 2y) + x(-8 + 3y)$$

## Minds on

# Factoring by Grouping Review

$$6x^2 - 8x + 3xy - 4y$$

3. Binomial Common Factor - \*You may need to change some signs here\*

$$6x^2 - 8x + 3xy - 4y$$

$$= 2x(3x - 4) + y(3x - 4)$$

$$= (3x - 4)(2x + y)$$

**DONE!**

$$6x^2 - 4y - 8x + 3xy$$

$$= 2(3x^2 - 2y) + x(-8 + 3y)$$

UHOH!

Looks like we made a bad choice.

$$6x^2 + 3xy - 8x - 4y$$

$$= 3x(2x + y) + 4(-2x - y)$$

To make these the same, factor a negative out of the second binomial.

$$= 3x(2x + y) - 4(2x + y)$$

We changed  
every sign

$$= (2x + y)(3x - 4)$$

**Action!**

# What's the Pattern I?

Come up and give it a shot!

$$\begin{aligned} &(x + 3)(x + 4) \\ &= x^2 + 4x + 3x + 12 \\ &= x^2 + 7x + 12 \end{aligned}$$

$$\begin{aligned} &(y + 7)(y + 2) \\ &= y^2 + 9y + 14 \end{aligned}$$

$$\begin{aligned} &(g + 1)(g + 8) \\ &= g^2 + 9g + 8 \end{aligned}$$

$$x^2 + 7x + 12$$

$$y^2 + 9y + 14$$

$$g^2 + 9g + 8$$

What's the Pattern?

The first term is always the variable squared.

The coefficient on the second term is always the sum of the two constants.

The coefficient on the third term is always the product of the two constants.

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**Action!**

# Factor It!

Come up and give it a shot!

$$x^2 + 9x + 20$$

$$= (x+4)(x+5)$$

1	20	x
2	10	x
4	5	✓

Find two numbers that  
add to give 9 and  
multiply to give 20.

$$(x + 4)(x + 5)$$

$$y^2 + 5y + 6$$

$$= (y+3)(y+2)$$

Find two numbers that  
add to give 5 and  
multiply to give 6.

$$(y + 3)(y + 2)$$

$$z^2 + 10z + 25$$

$$= (z+5)(z+5)$$

$$= (z+5)^2$$

Find two numbers that  
add to give 10 and  
multiply to give 25.

$$(z + 5)^2$$

## Action!

# What's the Pattern II?

Come up and give it a shot!

$(x - 4)(x + 5)$ $= x^2 + x - 20$	$(y - 8)(y + 2)$ $= y^2 - 6y - 16$	$(g + 1)(g - 6)$ $= g^2 - 5g - 6$
$x^2 + x - 20$	$y^2 - 6y - 16$	$g^2 - 5g - 6$

### What's the Pattern?

The first term is always the variable squared.

The coefficient on the second term is always the sum of the two constants.

The coefficient on the third term is always the product of the two constants.

**Action!**

## Factor It!

Come up and give it a shot!

$$x^2 + 4x - 21$$

$$= (x+7)(x-3)$$

Factors of -21  
 $1 \times -21$     $-1 \times 21$   
 $3 \times -7$     $-3 \times 7$

Find two numbers that  
add to give 4 and  
multiply to give -21.

$$(x + 7)(x - 3)$$

$$y^2 + 1y - 6$$

$$= (y+3)(y-2)$$

Factors of -6

Find two numbers that  
add to give 1 and  
multiply to give -6.

$$(y + 3)(y - 2)$$

$$z^2 - 3z - 10$$

$$= (z-5)(z+2)$$

Factors of -10

Find two numbers that  
add to give -3 and  
multiply to give -10.

$$(z - 5)(z + 2)$$



**Action!**

## What's the Pattern III?

Come up and give it a shot!

$$(x - 6)(x - 3) \\ = x^2 - 9x + 18$$

$$(y - 5)(y - 1) \\ = y^2 - 6y + 5$$

$$(g - 4)(g - 7) \\ = g^2 - 11g + 28$$

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

$$y^2 - 6y + 5$$

$$g^2 - 11g + 28$$

What's the Pattern?

The first term is always the variable squared.

The coefficient on the second term is always the sum of the two constants.

The coefficient on the third term is always the product of the two constants.

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**Action!****Factor It!**

Come up and give it a shot!

$$x^2 - 8x + 12$$

$$= (x-6)(x-2)$$

1, 12   -1, -12

Find two numbers that  
add to give -8 and  
multiply to give 12.

$$(x - 6)(x - 2)$$

$$y^2 - 7y + 12$$

$$= (y-3)(y-4)$$

Find two numbers that  
add to give -7 and  
multiply to give 12.

$$(y - 3)(y - 4)$$

$$z^2 - 6z + 9$$

$$= (z-3)(z-3)$$

$$= (z-3)^2$$

Find two numbers that  
add to give -6 and  
multiply to give 9.

$$(z - 3)^2$$

## Factoring $x^2 + bx + c$

To factor trinomials in the form  $x^2 + bx + c$

1. Write  $x$  as the first term in each **binomial factor**.

2. Find two numbers that <sup>(add)</sup> sum to  $b$  and multiply to  $c$ .

3. Use the numbers found in Step 2 as the second terms in each binomial factor.

4. When you are factoring a trinomial, **ALWAYS common factor** first!

Worked Example

$$\text{Factor } 3x^2 + 3x - 18$$

**\*\*Remember to common factor first!\*\***

$$3x^2 + 3x - 18$$

Factor a 3 out of every term.

$$= 3(x^2 + 1x - 6)$$

Find two numbers that sum to 1 and multiply to give -6.

Factors of -6

	1, -6	-1, 6	2, -3	
sum	-5	+5	-1	

$$\begin{array}{c} -2, 3 \\ +1 \end{array}$$

$$= \underline{3}(x + 3)(x - 2)$$

Don't forget about me!

## Consolidation

That little guy?  
I wouldn't worry about that little guy.

Factor  $x^2 - 2xy - 15y^2$ .

$$= (x + 3y)(x - 5y)$$

Factors of -15

	1, -15	-1, 15	3, -5	-3, 5
sum	-14	+14	-2	+2

## Factoring $x^2 + bxy + cy^2$

To factor trinomials in the form  $x^2 + bxy + cy^2$

1. Write  $x$  as the first term in each **binomial factor**.
2. Find two numbers that sum to  $b$  and multiply to  $c$ .
3. Use the numbers found in Step 2 **with a  $y$  attached** as the second terms in each binomial factor.
4. When you are factoring a trinomial, **ALWAYS common factor** first!

## Consolidation

Homework

**WRITE IN YOUR LOG**

**Pg. 156**

1-6 (a, c, f)  
AND 4(n, o)  
6(i)

As always, if you struggle with these,  
try some more.  
**AND COME IN FOR HELP!**