

Get out your homework from last night and the second page of your syllabus if it is signed!

$$7x^2 - 21x$$

$\overset{1}{\textcircled{7}}$   $\overset{3}{\textcircled{7}}$   
 $\textcircled{x}x$   $\textcircled{x}$

① Find GCF

$$\text{GCF: } x \cdot 7 = 7x$$

$$7x(1x - 3)$$

② write in factored form  
↳ dividing

U7 Day 4 Practice

Name: \_\_\_\_\_

Factoring - GCF

Date: \_\_\_\_\_ Block: \_\_\_\_\_

Choose any five problems that are connected below (they can be in a line vertically, horizontally, or diagonally). Once selected, factor each polynomial. Write your answer in the same space as the problem. Do any scratch work needed on the back.

| B                                     | I                                   | N                                   | G                                     | O                                   |
|---------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|
| $x^2 + 10x$<br><br>$x(x + 10)$        | $x^2 - 9x$<br><br>$x(x - 9)$        | $-2x^2 - 4x$<br><br>$-2x(x + 2)$    | $7x^2 - 21x$<br><br>$7x(x - 3)$       | $4n^3 + 16n^2$<br><br>$4n^2(n + 4)$ |
| $8x^2 + 24x$<br><br>$8x(x + 3)$       | $18x^3 - 24x$<br><br>$6x(3x^2 - 4)$ | $x^2 - 6x$<br><br>$x(x - 6)$        | $-2x^2 - 4x$<br><br>$-2x(x + 2)$      | $7x^2 - 21x$<br><br>$7x(x - 3)$     |
| $-2x^2 - 4x$<br><br>$-2x(x + 2)$      | $3b^2 - 81b$<br><br>$3b(b - 27)$    | $24x^3 - 32x$<br><br>$8x(3x^2 - 4)$ | $10x^2 + 40x$<br><br>$10x(x + 4)$     | $18x^2 + 12x$<br><br>$6x(3x + 2)$   |
| $27r^3 - 18r^2$<br><br>$9r^2(3r - 2)$ | $-30x^2 + 25x$<br><br>$-5x(6x - 5)$ | $7x^2 - 21x$<br><br>$7x(x - 3)$     | $3b^2 - 81b$<br><br>$3b(b - 27)$      | $18x^3 - 24x$<br><br>$6x(3x^2 - 4)$ |
| $7x^2 - 21x$<br><br>$7x(x - 3)$       | $-2x^2 - 4x$<br><br>$-2x(x + 2)$    | $-30x^2 + 25x$<br><br>$-5x(6x - 5)$ | $16n^3 + 20n^2$<br><br>$4n^2(4n + 5)$ | $8x^2 + 24x$<br><br>$8x(x + 3)$     |

Factoring Trinomials when a=1

**Review:** Factor by finding the GCF.

1)  $8x^2y^3 + 16xy^3$   
 $GCF = 2 \cdot 2 \cdot 2 \cdot x \cdot y \cdot y \cdot y$   
 $8xy^3(x+2)$

2)  $-4x^2 + 2x - 16$   
 $GCF = -2$   
 $-2(2x^2 - 1x + 8)$

**Factoring Trinomials when a=1**

When factoring a trinomial, you first want to make sure that your trinomial is in **general form**. General form is:  $ax^2 + bx + c$

Today we are going to factor trinomials whose leading coefficients (a) are 1.

Using the box below, determine what trinomial is represented in the box. (Think about the final step of multiplication).

$x^2 + 2x + 6x + 12 =$

$1x^2 + 8x + 12$

|      |        |      |
|------|--------|------|
| $1x$ | $1x^2$ | $2x$ |
| $+6$ | $6x$   | $12$ |

Factor pairs for 12:  $(1, 12), (2, 6), (3, 4)$

Now, find the GCF of **each** row and column of the table. Write your answer in factored form.

$(1x + 6)(1x + 2)$

**Practice:**

Trinomial **inside** the boxes:  $x^2 - 3x - 15 \rightarrow x^2 + 2x - 15$

|      |        |       |
|------|--------|-------|
| $1x$ | $1x^2$ | $-3x$ |
| $5$  | $5x$   | $-15$ |

Factor pairs for -15:  $(1, -15), (3, -5)$

Factored Form:  
 (find GCF of each row and column)  
 $(1x + 5)(1x - 3)$

$x^2 - 10x + 24$   
 Trinomial **inside** the boxes:  
 $x^2 - 6x - 4x + 24$   
 Factored Form:  
 (find GCF of each row and column)  
 $(1x - 4)(1x - 6)$   
 or  $(x - 4)(x - 6)$

You just factored a trinomial using the box method!!

There are many different ways to factor a trinomial, but we are going to focus on the box method since we are already familiar with using the boxes to represent multiplication.

$ax^2 + bx + c$       $a, b, \text{ \& } c$  are  $\neq 0$

**Factoring a trinomial means to write the trinomial as a product of two binomials.**

Typically, you are not given a box that is already filled in. You will be given a trinomial and have to create the box and factor.

**Example:** Factor  $x^2 - 4x - 32$

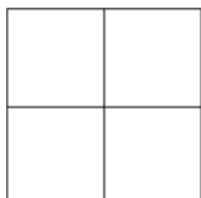
$a = 1$       $b = -4$       $c = -32$

| Steps (written out)   | Steps (worked out)                |
|---|-----------------------------------|
| 1) Multiply $a$ and $c$ together. Place that number in the <u>bottom</u> of the $x$ .<br>Place $b$ in the <u>top</u> of the $x$ .<br>Find two numbers that <b>multiply</b> to get the <u>bottom</u> number and <b>add</b> to get the <u>top</u> number.   |                                   |
| 2) Create a $2 \times 2$ box and place the first term of your <b>original trinomial</b> in the first box. Place the last term of your <b>original trinomial</b> in the last box.<br>Fill in the remaining 2 boxes with the numbers on the left and right of your $x$ from above. Be sure to place an $x$ after each number. |                                   |
| 3) Find the GCF of each row and column and write it in the corresponding area. Write these as the two binomials for the factored form.  | Factored Form: $(1x + 4)(1x - 8)$ |
| 4) Check you work by multiplying the binomials together to see if you get your original trinomial.  |                                   |

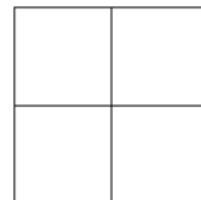
# Homework: Numbers 1 and 2!

## Practice

✖ 1)  $x^2 + 6x + 8$



✖ 2)  $x^2 - 7x + 12$



3)  $x^2 + 4x - 12$

4)  $x^2 + 2x + 1$

