

Name: "Teacher"

Date: 11/3/14

Section 2P6

**Factor Polynomials with GCF**

Ex. 1 Factor.  $3n^2 - 9n + 6$  GCF: 3

$$3(n^2 - 3n + 2)$$

$$3(n^2 - 2n - 1n + 2)$$

$$3(n-1)(n-2)$$

You Try 2 Factor.  $2n^2 + 2n - 12$  GCF: 2

$$2(n^2 + n - 6)$$

$$2(n^2 + 3n - 2n - 6)$$

$$2(n+3)(n-2)$$

**Factor Polynomials with  $a \neq 1 \rightarrow ax^2 + bx + c$**

Ex. 3 Factor.  $2x^2 + x - 6$   
 $\begin{matrix} a & b & c \end{matrix}$

Scratch Work

$$a=2 \quad c=-6$$

$$2(-6) = -12$$

1	12
2	6
4	-3

big # (+)

Steps

- 1) Multiply the "a" by the "c."
- 2) Find the two numbers whose product is  $a \cdot c$  and whose sum is  $b$ .  
*\*\* bigger # have the sign of b (middle term)*
- 3) Use those numbers to write like terms.
- 4) Split the middle!
- 5) Factor out the GCF of each side.
- 6) Write the factored form of the polynomial by grouping.

$$2x^2 + 4x - 3x - 6$$

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

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

same leftovers

Ex. 4 Factor.  $3z^2 - 2z - 8$

Scratch Work

$$a=3 \quad c=-8$$

$$3(-8) = -24$$

-6	4
8	3
2	12
1	24

big # (-)

Does Order of Like Terms Matter?

$$3z^2 - 6z + 4z - 8$$

$$3z(z-2) + 4(z-2)$$

$$(z-2)(3z+4)$$

order doesn't matter!

$$3z^2 + 4z - 6z - 8$$

$$z(3z+4) - 2(3z+4)$$

$$(3z+4)(z-2)$$

You Try 5 Factor the polynomial  $2n^2 + 3n - 9$ .

Scratch Work

$$a=2 \quad c=-9$$

	-18
9	2
6	-3
1	18

$$2n^2 + 6n - 3n - 9$$

$$2n(n+3) - 3(n+3)$$

$$(n+3)(2n-3)$$

Ex. 6 Factor the polynomial  $6x^2 - 26x - 20$ .

Scratch Work

$$a=3, c=-20$$

	-30
1	30
2	15
3	10
6	5

pull out  
GCF first!

$$2(6x^2 - 26x - 20) \quad \text{GCF: } 2$$

$$2(3x^2 - 13x - 10)$$

$$2[3x^2 - 15x + 2x - 10]$$

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

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

↑  
GCF

You Try 7 Factor the polynomial  $6k^2 + 15k + 6$ .

Scratch Work

$$36$$

	6
12	3

OR → GCF: 3

$$6k^2 + 12k + 3k + 6$$

$$6k(k+2) + 3(k+2)$$

$$(k+2)(6k+3)$$

$$3(2k^2 + 5k + 2)$$

$$3[2k^2 + 1k + 4k + 2]$$

$$3[k(2k+1) + 2(2k+1)]$$

$$3(2k+1)(k+2)$$

$$3(k+2)(2k+1)$$

$$a \cdot c$$

	4
1	4
2	2