

Chapter 8b Student Success Sheet (SSS)

Factoring Polynomials

Olathe East High School – Intermediate Algebra

Name: _____

Hour: _____

Reminders:

- Homework is completed in **homework packet**.
- **All pages** in homework notebook should be done in pencil!

Need Help? Support is available!

- www.mhollan.weebly.com
- www.srushingoe.weebly.com

“Success is not measured by what you accomplish, but by the opposition you have encountered, and the courage with which you have maintained the struggle against overwhelming odds.”
~Orison Swett Marden

Concept #	What we will be learning...	# of Videos
1	Finding GCF (both numbers and variables)	2
2	Factoring trinomials by grouping with middle term already split	1
3	Factoring trinomials: $a \neq 1$ and then $a = 1$ (grouping method and box method); includes ones with GCF	4
4	Factoring difference of two squares and perfect square trinomials	2

Divisibility Math Tricks - MEMORIZE THESE!

Dividing by 2

1. All even numbers are divisible by 2.
 - For example: all numbers ending in 0,2,4,6 or 8

Dividing by 3

1. Add up all the digits in the number.
2. Find out what the sum is. If the sum is divisible by 3, so is the number.
 - For example: 12123 ($1+2+1+2+3=9$) 9 is divisible by 3, therefore 12123 is too!

Dividing by 4

1. Can you divide your number by 2 TWICE? If so, your number is divisible by 4!
 - For example: 244 divided by 2 is 122, 122 divided by 2 is 61. Therefore 244 is divisible by 4

Dividing by 5

1. Numbers ending in a 5 or a 0 are always divisible by 5.

Dividing by 6

1. If the Number is divisible by 2 **and** 3 it is divisible by 6 also.

Dividing by 9

1. Almost the same rule as dividing by 3. Add up all the digits in the number.
2. Find out what the sum is. If the sum is divisible by 9, so is the number.
 - For example: 43785 ($4+3+7+8+5=27$) 27 is divisible by 9, therefore 43785 is too!

Dividing by 10

1. If the number ends in a 0, it is divisible by 10.

#1 Finding GCF (including numbers and variables)

1. Highlight all of the n _____ and find the G _____ C _____ F _____ of all of them.
(Remember that a GCF cannot be any b _____ than the s _____ number in the problem)
2. Box all of the v _____ and find the biggest power that is i _____ c _____!
(Remember that it will be the s _____ power in the problem)
3. Write your answer with the GCF on the o _____ .
4. Divide every term in the problem by the GCF to get what goes on the i _____.

*If the f _____ t _____ is ever n _____, the GCF you choose must also be n _____ !

1) $36x^3 + 9x$

2) $12 + 3x$

3) $-24 + 54m$

4) $8x^3 + 16x^4$

5) $-30x^4 - 50x^3$

6) $-9b^2 + 18b + 36$

7) $-72 + 90x - 81x^4$

8) $25k^6 - 25k^4 + 10k^2$

9) $28r^{12} + 40r^9 - 20r^8 - 40r^7$

10) $-20n^3 + 100n^2 + 50n + 20$

#2 Factoring trinomials by grouping with middle terms already split

Notes Different ways to phrase these directions: Factor. Factor the trinomial. Factor the polynomials.

What are the factors of the following polynomials? Factor completely. Find the factors.

$$2n^2 - 7n - 30$$

$$2n^2 - 12n + 5n - 30$$

Mustache Method

Box Method

11) $x^2 - 13x + 30$
 $x^2 - 10x - 3x + 30$

12) $r^2 - 2r - 48$
 $r^2 - 8r + 6r - 48$

13) $n^2 - 10n + 16$
 $n^2 - 8n - 2n + 16$

14) $x^2 + 2x - 15$
 $x^2 + 5x - 3x - 15$

15) $5x^2 - 12x + 7$
 $5x^2 - 7x - 5x + 7$

16) $3v^2 - 19v + 20$
 $3v^2 - 15v - 4v + 20$

17) $2r^2 + 5r + 3$
 $2r^2 + 2r + 3r + 3$

18) $7a^2 + 20a + 12$
 $7a^2 + 14a + 6a + 12$

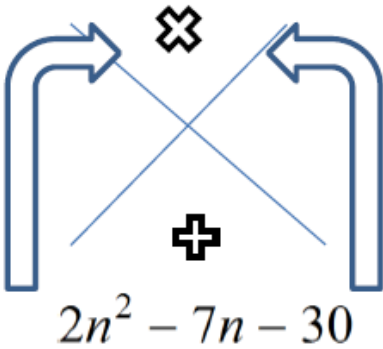
#3 Factoring trinomials: $a \neq 1$ and then $a = 1$ (grouping method and box method); includes ones with GCF

Notes

“SPLITTING” the Middle

Make your **TRInomial** into a **POLYnomial** with 4 terms by splitting the middle term.

Given: $2n^2 - 7n - 30$



1. Set up the “X” and find two numbers that work.

2. In this case, _____ and _____ both add to _____ and multiply to _____.

3. Split the middle “X” term into two “X” terms.

4. Now factor by the **Mustache Method** or by the **Box Method**.

Mustache Method

Box Method

IMPORTANT! Always look for a GCF first!

$6x^2 + 42x + 60$

Is there a GCF? **Yes**/no

$6(x^2 + 7x + 10)$



Answer:

$6(\quad)(\quad)$

$5n^2 + 9n - 2$

Is there a GCF? Yes/**no**

$5n^2 + 9n - 2$



Answer:

$(\quad)(\quad)$

$-5r^2 + 19r + 4$

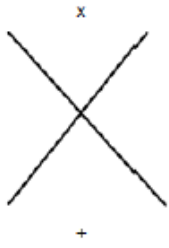
Is there a GCF? **Yes**/no

$-1(5r^2 - 19r - 4)$



Answer:

$-1(\quad)(\quad)$



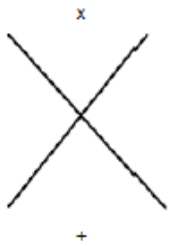
19) $3n^2 - 12n - 15$



20) $x^2 - x - 72$



21) $6m^2 - 66m + 144$



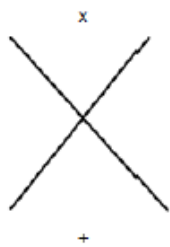
22) $-5x^2 + 29x - 20$



23) $-7n^2 + 67n + 30$



24) $7x^2 - 52x - 32$



25) $4x^2 + 48x + 140$



26) $6a^2 - 12a - 144$



27) $v^2 + 2v - 35$



28) $8p^2 - 60p + 28$



29) $20k^2 - 64k - 180$

#4 Factoring: Difference of Two Squares and Perfect Square Trinomials

Notes**Difference of Squares:**

1. Do you have _____ terms?
2. Are those terms _____?
3. Is everything in the problem a _____?
 - a. If not, can you take out a _____ and then make it that way?

Perfect Square trinomials

1. These are nothing special, except for when you look at their _____, and you can write them in a special way!

30) $9x^2 - 1$

31) $1 - k^2$

32) $25p^2 - 16$

33) $4r^2 - 1$

34) $48v^2 - 75$

35) $100x^2 - 16$

36) $18x^2 - 32$

37) $48n^2 - 27$

38) $r^2 + 2r + 1$

39) $n^2 + 6n + 9$

40) $3v^2 - 30v + 75$

41) $5n^2 - 40n + 80$