Foundations of Math

Chapter 7 Packet

Part 2 - Factoring

name:

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Name:_____ Notes #77

Factoring by Grouping

Review: Multiple the binomials.

1) $(5x^2 + 6)(5x + 1)$

2) $(4x^2 - 3)(7x + 4)$

Sometimes, all of the terms won't share the same _____.

When there are _____ terms that don't all share a GCF, you can factor

(un-_____) by using a method called GROUPING!

Grouping is when you find the GCF of _____ terms at a time in a problem with _____ terms total.

If done correctly, you will end up with two sets of _____ with the ***exact same thing*** inside.

This skill needs to be mastered because you will be using it in all of the rest of your math classes.

3) $25x^3 + 5x^2 + 30x + 6$

Step 1: Mark your two groups

Step 2: Find the GCF of the first group and write it down

Step 3: Divide each term in the first group by the GCF and write the answers in parentheses next to your GCF. DON'T FORGET THE SIGNS!

Step 4: Repeat steps 2 and 3 for the second group.

Step 5: If your parentheses match, pull them out and write what is left over in a new set of parentheses.

4) $4x^3 - 12x^2 - 5x + 15$

5) $49x^3 - 35x^2 + 56x - 40$

6) $24x^3 + 15x^2 - 56x - 35$

7) $24x^3 - 64x^2 - 21x + 56$

8) $28x^3 + 16x^2 - 21x - 12$

9) $42mc + 36md - 7n^2c - 6n^2d$

10) $12x^2u + 3x^2v + 28yu + 7yv$

11) $12bc - 4bd - 15xc + 5xd$

Name:_____ Notes #78

FACTORING BY GROUPING DAY 2

1) $8x^3 - 64x^2 + x - 8$

2) $12p^3 - 21p^2 + 28p - 49$

3) $12x^3 + 2x^2 - 30x - 5$

4) $6v^3 - 16v^2 + 21v - 56$

5) $63n^3 + 54n^2 - 105n - 90$

6) $21k^3 - 84k^2 + 15k - 60$

7) $25v^3 + 5v^2 + 30v + 6$

8) $28v^3 + 16v^2 - 21v - 12$

9) $4v^3 - 12v^2 - 5v + 15$

10) $24p^3 + 15p^2 - 56p - 36$

11) $16mn - 4m^2 + 28n - 7m$

12) $21xy + 15x + 35ry + 25r$

Name:_____ Notes #79

Factoring a Quadratic

A quadratic is a _____ of the form

$$ax^2 + bx + c$$

The x^2 term is always first

The number all by itself is always last

$$9n - 6 + 6n^2 - 4n$$

How can we factor a quadratic by grouping if there are only 3 terms instead of 4 terms?

We have to split the _____ term using what we call the _____.

Step 1: Multiply _____ by _____.

Step 2: List the factors of the product from Step 1.

Step 3: Circle the pair of factors that add up to the _____ term.

Step 4: Split the _____ term up by replacing it with the circled pair from Step 3.

Step 5: Factor by grouping as usual.

1) $5n^2 - 19n + 12$

2) $m^2 - 9m + 8$

How to Get the List of Factors in Your Calculator:

Step 1: Hit [Y =]
Step 2: Type in "$\# \div x$" (# represents whatever $a \cdot c$ equals).
Step 3: Hit [2nd], then hit [Graph]
Step 4: Starting at $x = 1$, write down all of the x, y pairs that are WHOLE NUMBERS. Those are your factors!
SKIP ALL OF THE DECIMALS!

3) $3p^2 - 2p - 5$

4) $2n^2 + 3n - 9$

5) $x^2 - 16x + 63$

6) $2b^2 + 17b + 21$

7) $3n^2 - 8n + 4$

8) $7x^2 - 31x - 20$

9) $5p^2 - p - 18$

10) $9r^2 - 5r - 10$

Name:_____ Notes #80

Factoring Quadratics Day 2

Review: Factor the following.

a) $8x^2y + 4xy^2$

b) $49x^2 - 100y^2$

Remember the Steps for Factoring a Quadratic

Step 1: _____ $\boldsymbol{a}$ by $\boldsymbol{c}$.

Step 2: List the _____ of the product from Step 1.

Step 3: Circle the pair of factors that _____ up to the middle term ($\boldsymbol{b}$).

Step 4: Split the $\boldsymbol{b}$ term up by replacing it with the _____ from Step 3.

Step 5: Factor by _____ as usual.

How can I be positive that my answer is correct? _____

_____

1) $7m^2 + 6m - 1$

2) $3k^2 + 17k + 10$

3) $2x^2 - 9x - 81$

4) $3n^2 - 16n + 20$

5) $3v^2 + 14v - 49$

6) $5x^2 - 43x + 24$

7) $3n^2 - 8n + 4$

8) $5n^2 + 19n + 12$

Name:_____ Notes #81

Factoring Completely Day 1

Review: Factor the following.

a) $16x^2y + 8x^3y$

b) $3v^2 + 14v - 49$

Factoring Completely:

★ USUALLY means we will have use _____ factoring methods in the same problem. ★

Step 1: Always look for a _____ FIRST (_____ **and** _____)!

Step 2a: If there are _____ terms, try factoring by _____.

Step 2b: If there are _____ terms, see if it is _____.

Step 2c: If there are _____ terms, use the _____ method to factor.

1) $3x^2 - 21x + 36$

2) $5b^4 - 20b^3 - 105b^2$

3) $6x^2y - 54y$

4) $5x^3 - 55x^2 + 150x$

5) $27b^2x^3 + 121b^2x$

6) $4p^5 + 44p^4 + 120p^3$

7) $72x^2y - 2y^3$

8) $200x^3y - 18xy^3$

Name:_____ Notes #82

FACTORING COMPLETELY DAY 2

Remember:

Step 1: Check for a _____ FIRST!

Step 2a: 2 terms = _____

Step 2b: 4 terms = Factor by _____

Step 2c: 3 terms = _____ Method

1) $8x^2 - 70x + 48$	**2)** $7m^3 + 7m^2 - 1m^2 - 1m$
3) $108x^3 - 75xy^2$	**4)** $100m^4 + 230m^3 + 60m^2$

5) $7y^3 + 42y^2 + 56y$	**6)** $128x^2y - 32m^2y$
7) $x^4 - 1$	**8)** $4p^5 + 36p^4 + 72p^3$
9) $10x^2 - 86x + 48$	**10)** $6n^2m + 20nm - 16m$

Name:_____ Notes #83

Factoring Completely Day 3

1) $10x^2 - 86x + 48$

2) $4p^5 + 44p^4 + 120p^3$

3) $72x^2y - 2y^3$

4) $14p^2q - 40pq + 24q$

5) $16x^4 - 81y^4$

6) $5a^2 - 180$

7) $2b^2 - 28b + 98$

8) $18x^2 - 8$

Name:_____ Foundations Homework 82

COMPLETELY FACTOR the following:

1) $3y^2 + 18y + 24$

2) $98m^2w - 128p^2w$

3) $10x^2 - 86x + 48$

1) $75p^2 - 12w^2$

2) $6r^2 - 72r + 192$

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

Name_____ Foundations Homework 80

Factor the following trinomials. (AC Method)!

1) $3n^2 + 10n - 8$

2) $4x^2 - 35x + 24$

Name_____ Foundations Homework 79

Factor the following trinomials. (AC Method).

1. $n^2 + n - 6$

2. $x^2 + 7x - 18$

Name:_____ Foundations Homework 78

Factor the following polynomials by grouping.

1) $x^2 - 30x + 2x - 60$

2) $2n^2 + 4n + 1n + 2$

Name_____ Foundations Homework 77

Factor by grouping.

1) $5x^2 + 15x + 3x + 9$

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