FACTORING METHOD 1: GREATEST COMMON FACTOR (GCF) Day 1

Warm-Up: What property is illustrated by: $5a+5b=5(a+b)$ _____

- To factor means to _____
- **GCF Factored Answer will be written using the _____ property**

PROCEDURE FOR GCF FACTORING:

- Determine what #/(or expression) may be divided out of each term (REVERSED OUT)
- Determine what variable (with highest exponent) may be divided out of each term (REVERSED OUT)

What is _____ goes in _____ of the parenthesis for the final factored answer

Factor the following:

1. $5a^2-15$

2. $10x-25x^2$

3. $8ax-56a$

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

7. The area of a rectangle is represented by $3x^2 + 6x$ and the length by $x+2$. Express the width of the rectangle in terms of x.

8. The area of a triangle is represented by $24x^2+4x$ and the height by 8x. Express the base of the triangle in terms of x.

FACTOR BY GROUPING METHOD

Factor the following:

1. $4r^3 + 24r + r^2 + 6$

2. $2x^2 - 5x + 10x - 25$

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

4. $15x^2 - 10x + 9x - 6$

5. $7x^2 - 14x - 6x + 12$

6. $2x^3 - 5x^2 + 14x - 35$

Practice:

1. $48x^2y + 36x^3y^2$

2. $2x(x-4) + (x-4)$

3. The perimeter of a square is represented by $36x^2 + 8$. Find the area of the square.

FACTORING METHOD 2:

DIFFERENCE OF 2 PERFECT SQUARES (D2PS) Day 2

Recall: Simplify the following: $(x+2)(x-2)$

****These pair of factors are _____ of each other******

HOW TO FACTOR:

- **STEP 1: ALWAYS CHECK FOR _____**
- **STEP 2: To use D2PS FACTORING** method **must satisfy CHECK OFF LIST**
  D-
  2-
  PS-

Always check remaining factored parts to determine if they can be factored again!!!!

HOW TO WRITE FINAL FACTORED ANSWER

- **If expression has a GCF—**
  - divide out and leave GCF outside ( ) in final answer
- **After GCF is divided out… or there was no GCF**…
  - The remaining expression in the ( ) will be broken down into parts using the following setup.
    - Create **2 sets of ( )** with **2 different operation signs** in the middle of the ( ) (1 set of ( ) with a + sign, the other a – sign)
    - Take the _____ of both terms in expression.
    - Fill in the square roots of the terms in the parentheses. In the correct positions (before and after the operation sign)
    - **ANSWER WILL ALWAYS REPRESENT A _____ PAIR**

Factor the following:

1. $y^2 - 16$
2. $100r^2 - 9$
3. $3x^2 - 27$

4. $x^4 - 81$

5. $1 - 49x^2$

6. $225 - f^2g^2$

7. $\frac{1}{25} - x^2$

8. $a^2 - 0.36$

9. $c^2 - \frac{9}{4}$

10. The area of a rectangle is $25m^3 - 30m^2$ and the width is $5m^2$, what is the length in terms of m?

Practice:

1. $cm^2 - cd^2$

2. $25x^2 + 100$

3. $36 + n^2$

4. The area of rectangle is represented by $9x^2 - 25$. Find the perimeter of the rectangle in terms of x.

FACTORING METHOD 3: TRINOMIALS Day 3
(GROUPING Method)

Recall: Simplify the following: $(2y+3)(y-12)$

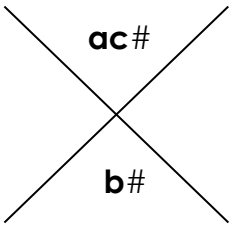
Answers are usually a TRINOMIAL in the form: _____, where a, b, and c are the coefficients.

HOW TO FACTOR:

- **STEP 1: ALWAYS CHECK FOR** _____
  - **If expression has a GCF**—divide out and leave GCF outside ( ) in final answer
  - **After GCF is divided out… or there was no GCF**…
    - The remaining expression in the ( ) will be broken down into parts using the following setup.

STEPS for Factoring <u>Trinomials</u>

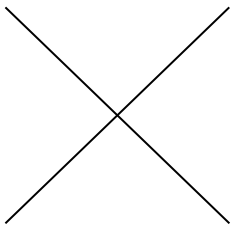
1. Make sure trinomial is in correct standard form.
2. **Create the x – diagram** and fill in with ac # and b#
   a. Multiply a# and c# (this is your ac#)
   b. Write down the b# (this is your **sum** #)
   c. Fill in missing parts with the factors



3. Rewrite the equation and **SPLIT THE MIDDLE TERM (bx)** using the 2 factors found in step 2.
   a. Put appropriate variables next to these terms
4. Factor the remaining expression (4 –TERMS) by GROUP FACTORING.

Factor the following:

1. $3x^2+10x+8$



2. $b^2 + 5b - 24$

3. $4x^2 - 4x - 48$

4. $4x^2 - 5xy - 6y^2$

5. $ax^2 - 9ax - 90a$

Practice:

1. $2x^2 + 7x + 6$

2. $3x^2 + 2x - 5$

3. $k^2 - k - 30$

4. $y^2 + 10y + 25$

MIXED FACTORING Day 4

HOW TO FACTOR (STEPS)

Step 1: _____

THEN CHOOSE EITHER …..

2:_____

3:_____

Factor the following completely:

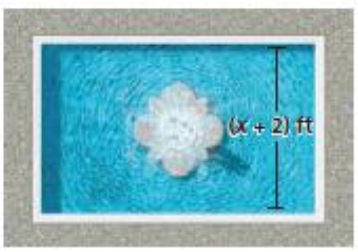
1. $m^2 + 13m - 30$

2. $4x^2 - 12x + 5$

3. $6x + 18$

4. $25x^2 - 100$

5. The area of a rectangular fountain is represented by $x^2 + 12x + 20 ft^2$. The width is $x + 2$ ft. Find the length of the fountain.



6. The volume of a rectangular prism is $x^3 - 7x^2 + 12x$. Determine what would represent the length, width, and height.

7. The length of a rectangular porch is $(x+7)$ft. The area of the porch is $(x^2 + 9x + 14)$ft^2. Find the width of the porch.

Practice:

1. If the area of a rectangle is $27a^3 - 18a^2$ and the length is $3a - 2$, what is the width in terms of a?

2. One factor of $49x^2 - 16$ is $7x - 4$. What is the other factor?
   (1) $7x - 4$ (2) $7x + 4$ (3) $-7x - 4$ (4) $-7x + 4$

3. Which are the factors of $18y^2 - 6y$?
   (1) $9y$ and $2y - 3$
   (2) $18y^2$ and $-6y$
   (3) $6y$ and $3y - 1$
   (4) $3y$ and $6y - 3$

REVIEW FACTORING METHODS Day 5

Recall: FACTORING STEPS: 1:_____

2: _____

3: _____

Factor the following completely:

1. $36xy^2 - 48x^2y$

2. $5(x+2)+x(x+2)$

3. $4g^2 - 81h^2$

4. $x^2 + 6x + 8$

5. $36 - x^2$

6. $9a^2 + 81b^2$

7. $x^2 - 10x + 21$

8. $36x^2 - 16x^5$

9. $2x(x-4) - (x-4)$

10. $1.21 - 4x^2$

11. $x^2 - 22x - 75$

12. $10w - 25w^2$

13. $2x^2 - 10x + 3x - 15$

14. $7x^3 + 35x^2 + 8x + 40$

15. $a^2 + 3a + 2$

16. $6y^2 + 2y$

17. $25x^2 - 16$

18. $5k^3 + 15k + 10k$

19. $2x^2 - 7x - 15$

20. $a^2 + a - 56$