

Factor by Grouping

Objective:

Factor a polynomial with 4 terms using grouping.

FACTOR OUT GCF - review

Remember: To factor out the **GCF** from a polynomial:

- I. Find the **GCF**
- II. Divide **EVERY TERM** in the polynomial by the **GCF**. Write the **GCF** on the outside of our parentheses. Put all the remainders inside the parentheses.

Example: $2x^2 + 6x$

$$= [2 \cdot x \cdot x] + [2 \cdot 3 \cdot x] \rightarrow \text{GCF} = 2x$$

$$= 2x(x + 3)$$

Factor out the **GCF** from the polynomial.

1) $-9 - 12x^3$

2) $-2 + 2b$

FACTOR BY GROUPING

Sometimes the entire polynomial doesn't have a **GCF** so we look at it half at a time.

Example: $x^3 - 3x^2 + 4x - 12$

$$\begin{aligned} &= x^3 - 3x^2 + 4x - 12 \\ &= x^2(x - 3) + 4(x - 3) \\ &= (x - 3)(x^2 + 4) \end{aligned}$$

FACTOR BY GROUPING – Steps. (write down)

Factoring (4 Terms)

- I. Group the terms with common factors.
- II. In each grouping, factor out the **GCF**.
- III. Factor out the common factor that remains.
- IV. CHECK YOUR ANSWER!**

Practice: Factor the polynomial.

3) $27p^3 + 9p^2 + 18p + 6$

4) $2p^2 + 4p + 3p + 6$

Sometimes you have to factor out a 1

$$5) \quad 6x^3 + 3x^2 + 2x + 1$$

Be very careful with negatives. Check as you go.

$$6) \quad 4n^3 - 4n^2 - 6n + 6$$

FACTOR BY GROUPING – any volunteers?

7) $3n^3 - 2n^2 - 6n + 4$ 8) $b^3 - b^2 - b + 1$

Factor by grouping CHALLENGE:

9) $ax - bx - ay + by$

Assignment:
Finish 2.2 worksheet
And
MathXL 2.2

Remember to show all your steps!