

Happy Friday!

-Please place Cell Phones in Holder.

Quizzes will be ready on Tuesday 9/3.

# Factoring High level Polynomials

# Grouping

Example 1:  $16x^3 - 8x^2 - 14x + 7$

$$8x^2(2x-1) - 7(2x-1)$$

$$(2x-1)(8x^2-7)$$

Example 2:  $49x^3 + 35x^2 - 14x - 10$

$$7x^2(7x+5) - 2(7x+5)$$

$$(7x+5)(7x^2-2)$$

When to use it:

When there are 4 terms.

Steps:

1. Group the 1st and 2nd term, then group 3rd and 4th term.

2. Pull out the GCF from each group

3. Make sure the parenthesis are the same

4. Pull out the GCF again (it is the parenthesis)

# Sum/Difference of Cubes

- $1^3 = 1$
- $2^3 = 8$
- $3^3 = 27$
- $4^3 = 64$
- $5^3 = 125$
- $6^3 = 216$
- $7^3 = 343$

Example 5:  $x^3 + 64$

$$(x + 4)(x^2 - 4x + 16)$$

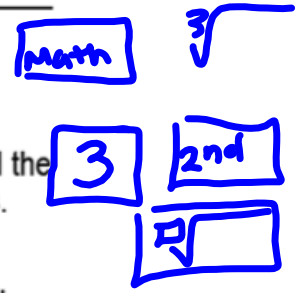
S  
3  
9  
S

o  
n  
-  
s  
o  
p  
o

A  
-  
3  
o  
x  
+  
1  
6

Example 6:  $x^3 - 27$

$$(x - 3)(x^2 + 3x + 9)$$



When to use it:

When there are 2 terms and the two terms are perfect cubes.

Steps:

1. Take the cube root of each term.
2. Fill in the pattern.
3. Fill in your signs according to SOAP

Pattern

$$a^3 \pm b^3 = (a \pm b)(a^2 \pm ab + b^2)$$

# Difference of Squares

When to use it:

When there are 2 terms and the two terms are perfect squares and there is subtraction between.

Steps:

1. Take the square root of each term.
2. Fill in the pattern.
3. Check to repeat process.

Pattern

$$a^2 - b^2 = (a + b)(a - b)$$

Example 7:  $16x^4 - 81$

$$(4x^2 + 9)(4x^2 - 9)$$

$$(4x^2 + 9)(2x + 3)(2x - 3)$$

Example 8:  $9x^4 - 25$

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

# Quadratic Form

When to use it:

When there are 3 terms.

Steps:

1. Multiply a and c
2. Find two factors that multiply to ac and add to b
3. Rewrite the polynomial to have 4 terms.
4. Group.

*hello*

Example 3:  $x^2 - 2x^2 - 48$

$$(x^2 + 6)(x^2 - 8)$$

$$+6x^2 - 8x^2 = -2x^2$$

Example 4:  $9x^2 + 6x^2 - 8$

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

$$-6x^2 + 12x^2$$

48  
 $\frac{48}{2} = 24$   
 $\frac{48}{3} = 16$   
 $\frac{48}{4} = 12$   
 $\frac{48}{6} = 8$

