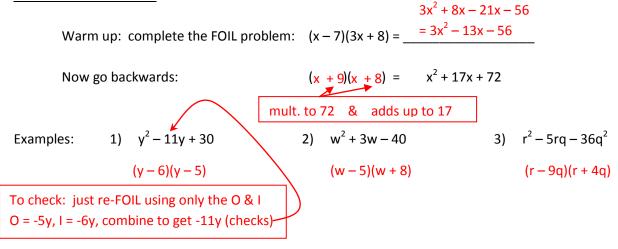
Algebra II

FACTORING

In my humble opinion, there are

8-different varieties of factoring to be concerned with.

TRINOMIAL FACTORING



DIFFERENCE OF 2-SQUARES

Warm up: FOIL, or more appropriately FL, this problem: $(2n + 9)(2n - 9) = \frac{4n^2 - 81}{(x + 7)(x - 7)} = \frac{4n^2 - 81}{x^2 - 49}$

Examples:	1) $m^2 - 121$	2) $25j^2 - 9$	3) $c^6 - \frac{25}{64}$	
	(m + 11)(m – 11)	(5j + 3)(5j – 3)	$\left(c^3+\frac{5}{8}\right)\left(c^3-\frac{5}{8}\right)$	

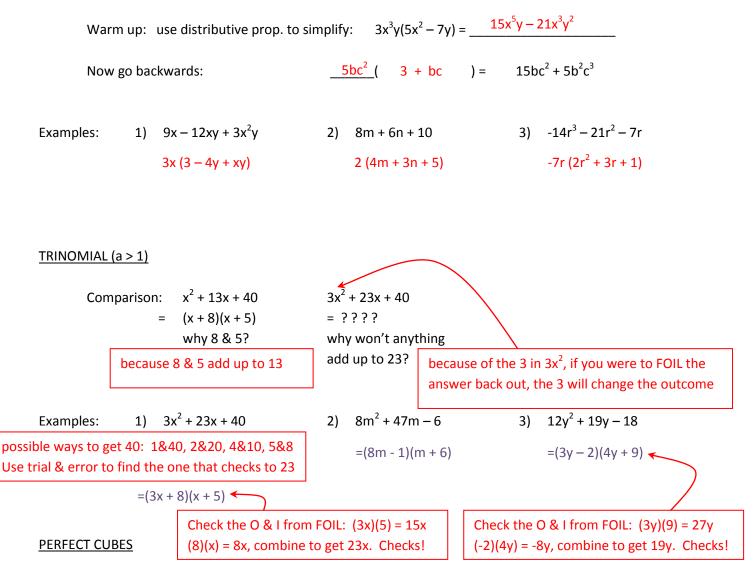
PERFECT SQUARES

Treat these just like the previous examples, and see what makes them unique.

Examples:	1) $a^2 + 12a + 36$	2) $m^2 - 4mn + 4n^2$	3) $9x^2 - 24x + 16$
	(a + 6)(a + 6)	(m + 2n)(m + 2n)	(3x + 4)(3x + 4)
	$=(a+6)^2$	$=(m + 2n)^2$	$=(3x + 4)^2$
For perfect write (squares, simplest form is to		

GREATEST COMMON FACTOR (GCF)

is the most forgotten, #1 mistake of all the types of factoring, so PAY ATTENTION!



Just for kicks, attempt the following. Notice the size of the parenthesis.

 $x^{3}-8 = (x-2)(x^{2}+2x+4)$

Example:	y ³ + 125	step(1), treat it like FOIL	(y (y)(y ² 5)(y ²) 25)
		step(2), the middle; mult. what's in the first ()	(у	5)(y²	5у	25)
		step(3), clean with SOAP	(y +	5)(y ² -	5y +	- 25)

1) $g^3 + 64$ Examples:

2) 27x³ – 1

3) $8a^3 - \frac{1}{27}b^3$ $(g + 4)(g^2 - 4g + 16)$ $(3x - 1)(9x^2 + 3x + 1)$ $\left(2a-\frac{1}{3}b\right)\left(4a^2+\frac{3}{3}ab+\frac{1}{9}b^2\right)$ Warm up: Factor (1-step only): $4x^3 - 2x + 12 = prime, can't do it!$ GCF's are almost always the first step, so if you forget to *always* attempt a GCF first...

Examples: 1) $x^3 + 5x^2 - 14x$	2) $8h^2 - 18$ 3)	$y^2 + w^3 y^2$
GCF: $x(x^2 + 5x - 14)$ factor again w/trinomial factoring $x^2 + 5x - 14 = (x + 7)(x - 2)$	GCF: $2(h^2 - 9)$ factor again w/difference of 2-squares = $2(h + 3)(h - 3)$	GCF: $y^2(1 + w^3)$ factor again w/perfect cube = $y^2(1 + w)(1 - w + w^2)$
Answer: $x(x + 7)(x - 2)$		

4) $ax^2 - 8ax + 16a$	5) $15p^2 - 35p - 30$	6) n ⁶ – 1
GCF: $a(x^2 - 8x + 16)$ now use perfect square $= a(x - 4)^2$	GCF: $5(3p^2 - 7p - 6)$ now use trinomial (a > 1) = $5(3p + 2)(p - 3)$	No GCF! use diff of 2-squares $(n^3 + 1)(n^3 - 1)$ now use perfect cube on both $(n + 1)(n^2 - n + 1)(n - 1)(n^2 + n + 1)$

To 2^{nd} step or not to 2^{nd} step, that is the question.

Examples:	1) $3j^7 - 9j^2 + 15j^3$	2) 8mn ² + 8mn + 2m	3) kx – 4k
	GCF = $3j^2$ ($3j^5 - 3 + 5j$)	GCF = $2m(4n^2 + 4n + 1)$	GCF = k (x - 4)
	When did we ever split up a j ⁵ ? Never!	There is an n-"squared" left in the ().2 nd step!!!	How can we possibly split the x up if there is only one? Can't!
	DONE	2m (2n + 1)(2n + 1) 2m (2n + 1) ²	DONE