Factoring

I can factor the greatest common factor out of an expression.
I can factor an expression by grouping.
I can factor quadratic expressions in standard form.

Find the greatest common factor (GCF) of the terms

$4x, 12$

4

$6x^3, 12x^2, 15x$

3x

$4x^3y^4, 8x^2y^3, 12xy^2$

$4xy^2$

Factor out the GCF

$$4a^2b^2 - 10ab^3 + 18a^3b^4$$

$2ab^2$ $\quad 2ab^2$ $\quad 2ab^2$

$$2ab^2(2a - 5b + 9a^2b^2)$$

Factor out the GCF

$$-2b^3 + 10b^2 + 8b$$

$2b(-b^2+5b+4)$ $\quad -2b(b^2-5b-4)$

You Try

Factor out the GCF

$$-5y^2 + 10y$$

$-5y$ $\quad -5y$

$$-5y(y-2)$$

Factor out the Greatest Common Binomial Factor

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

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

You Try

Factor out the Greatest Common Binomial Factor

$$4a(a-3)+3(a-3)$$

$$(a-3)(4a+3)$$

Factor by grouping

$$4x-4y+ax-ay$$

$$4(x-y)+a(x-y)$$

$$(x-y)(4+a)$$

Factor by grouping

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

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

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

Factor COMPLETELY by grouping

$$6x^2+8x+18x+24$$

$2(3x^2+4x+9x+12)$

$2[x(3x+4)+3(3x+4)]$

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

You Try (make sure they do this one)

Factor by grouping

$$2x^2+2x+x+1$$

$2x(x+1)+1(x+1)$

$(x+1)(2x+1)$

How to Factor a Quadratic

Factoring quadratics in the form $ax^2 + bx + c$

1. Factor out the GCF
2. Multiply a and c
3. Find two factors of ac that add to b
   *If ac is negative, factor.s must have opposite signs
   *If ac is positive, factors must have same (+ or -) signs
4. Re-write equation with b split up into factors
5. Find the GCF by grouping
6. Factor the GCF of the whole

( ) → when a = 1

Factor each quadratic expression

$2a^2 + 9a + 4$

$2a^2 + a + 8a + 4$

$a(2a+1) + 4(2a+1)$

$(2a+1)(a+4)$

$x^2 - 6x - 7$

-7: $+1, -7$

Factor: $(x+1)(x-7)$

Solve: $x+1=0$ $x-7=0$

$x=-1$ $x=7$

YOUR TURN!

Factor each quadratic expression

$x^2 + 6x + 8$

$(x+4)(x+2)$

$x^2 - 10x + 16$

$(x-2)(x-8)$

Factor each quadratic expression

$56 + 10x - x^2$

$-x^2 + 10x + 56$ $+4 \quad -14$

$-1(x^2 - 10x - 56)$

$-(x+4)(x-14)$

$35 - 12x + x^2$

YOUR TURN!

Factor each quadratic expression

$2x^2 + 13x + 15$ $\quad 30$: $1\ 30$, $2\ 15$, ~~$3\ 10$~~, $5\ 6$

$2x^2 + 3x + 10x + 15$

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

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

$4x^2 - 13x + 3$

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

$4x(x-3) - 1(x-3)$

$(4x-1)(x-3)$