Factoring out the Greatest Common Factor (GCF)

First Steps of Factoring a Polynomial using the Greatest Common Factor (GCF)

1. Find the Greatest Common Factor. If it consists of more than one term, gather the terms together in parentheses.
2. Using the reverse of the Distributive property, factor out the Greatest Common Factor from each term and place the remaining factors from each term together in parentheses.
3. The factors of the polynomial are the two factors from steps 1 and 2.

Factor $15x^3 - 30x^2 + 10x$ by first factoring out the GCF.

1. The GCF is $5x$.
2. Rewrite the terms as products of the GCF and another factor:

$$15x^3 - 30x^2 + 10x$$
$$(5x)(3x^2) - (5x)(6x) + (5x)(2) = (5x)(3x^2 - 6x + 2)$$

3. The factors are $5x$ and $3x^2 - 6x + 2$ written as $(5x)(3x^2 - 6x + 2)$

Examples:

$-2a^4c - 4a^3c^2 + 6a^2c$	$-42w^4z + 28w^3a$	$a(y-4) + b(y-4)$
GCF is $-2a^2c$	GCF is $-14w^3$	GCF is $(y-4)$
Factored:	Factored:	Factored:
$-2a^2c(a^2 + 2ac - 3)$	$-14w^3(3wz - 2a)$	$(y-4)(a+b)$
	When the 1st term is negative, Factor it out.	

TRY: Factor each by first factoring out the GCF.

$21a + 36$ $\quad -3x + 6$ $\quad 10x^2 + 5x$ $\quad 30x^3 - 15x$

$y(x-2) - 5(x-2)$ $\quad x(h+5) + y(h+5)$ $\quad m(n-8) + 7(n-8)$