Chapter 8.2 Factoring Out the GCF; Factoring by Grouping

Factoring expressions of the form $ax^2 + bx + c$ when a, b, and c have a common factor.
1. Find the GCF of a, b, and c 2. Check your answer by using the Distributive Property

Example:

Factor $12x^3 + 15x^2 - 21x$ The GCF is 3x

$12x^3 + 15x^2 - 21x = \boxed{3x(4x^2 + 5x - 7)}$

To factor a polynomial with four terms use the Grouping method.

Example 1:

Factor $8x^2(x-4) + 5(x-4)$

$8x^2(x-4) + 5(x-4)$ Factor out the common factor $(x-4)$

$\boxed{(x-4)(8x^2+5)}$

Example 2:

Factor $5x^3 + 15x^2 - 4x - 12$

$\underbrace{5x^3 + 15x^2} - \underbrace{4x - 12}$ Group the first two terms and the last two terms

$5x^2(x+3) - 4(x+3)$ Factor out $5x^2$ from the first 2 terms and –4 from the last 2 terms

$\boxed{(x+3)(5x^2-4)}$ Factor out $(x-3)$