

1.3 Algebraic Expressions

Objectives: Be able to simplify expressions; factor trinomials; use special factoring formulas; factor by grouping.

Simplifying Expressions

Example 1 Simplify the expression: $(x y - y^2)(x^2 + x y + y^2)$

Example 2 Simplify: $(\sqrt{h^2 + 1} + 1)(\sqrt{h^2 + 1} - 1)$

Factoring Expressions

Example 3 Factor the trinomials:

(a) $10x^2 + 29x - 21$

(b) $x^4 + 3x^2 - 28$

Example 4 Factor: $3x^3 + 5x^2 - 6x - 10$

Example 5 Factor: $12x^3y^5 + 8x^5y^4$

Example 6 Factor: $2x^{-1}y + 10x^{-2}y^2 + 12x^{-3}y^3$

The next two factoring examples are expressions that result from *The Product Rule* used in Calculus I.

Example 7 Factor: $4(2x + 5)^3 2(x + 4)^6 + (2x + 5)^4 6(x + 4)^5$

Example 8 Factor: $3x^2(2x + 1)^{1/2} + x^3 \cdot \frac{1}{2} \cdot (2x + 1)^{-1/2} \cdot 2$