L8 Factoring Special Polynomials

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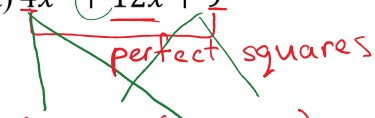
Lesson 8 Factoring Special Polynomials

Example 1 – Perfect Square Trinomials

(same factor twice)

Factor each trinomial. (Recall: You can verify by multiplying the factors.)

a) $4x^2 + 12x + 9$



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

or

$(2x+3)^2$

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

$6x + 6x$

$12x$

b) $4 - 20x + 25x^2$

rewrite $25x^2 - 20x + 4$

$(5x-2)(5x-2)$

or $(5x-2)^2$

check "sum"

$(5x-2)(5x-2)$

$-10x - 10x$

$-20x$

Difference of Squares

A Difference of Squares is a binomial of the form $a^2 - b^2$.

$(a+b)(a-b)$

A difference of squares results when you multiply two binomials that are the ***sum*** and the ***difference*** of the same two quantities (conjugates).

$(x+y)(x-y)$

same terms, different signs

$x^2 - xy + xy - y^2$

$x^2 - y^2$

Perfect square minus Perfect square

Example 3 – Factoring a Difference of Squares

Factor each binomial.

a) $36x^2 - 25$

$(6x + 5)(6x - 5)$

Square root first and last terms
Opposite signs (+, −)

b) $16m^2 - 49n^2$

$(4m - 7n)(4m + 7n)$

or

$(4m + 7n)(4m - 7n)$

c) $\frac{3a^3}{3a} - \frac{12ab^2}{3a}$

$3a(a^2 - 4b^2)$

GCF

difference of squares

$3a(a + 2b)(a - 2b)$

d) $x^4 - 16$

$(x^2 + 4)(x^2 - 4)$

diff of squares

$(x^2 + 4)(x - 2)(x + 2)$

Note: a sum of squares does not factor

Factoring Special Cases sheet (odds)

Try $4x^2 - 81$

$18x^2 - 2$