L6 Factoring Special Polynomials

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Lesson 6 Factoring Special Polynomials

Example 1 – Perfect Square Trinomials

Factor each trinomial. (Recall: Use multiplication to check.)

a) $36x^2 + 84x + 49$

both perfect squares

$(6x+7)(6x+7)$ or $(6x+7)^2$

$42x + 42x$
$84x$ ← gives the middle term

b) $121 - 44x + 4x^2$

rewrite

$4x^2 - 44x + 121$

$(2x-11)(2x-11)$ or $(2x-11)^2$

$-22x - 22x = -44x$ ✓

sum
$2\sqrt{a}\sqrt{c}$
$2\sqrt{4}\sqrt{121}$
$2(2)(11)$
44

Difference of Squares

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

↳ subtract

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

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

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

$x^2 - y^2$

$a^2 - b^2$

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

Example 3 – Factoring a Difference of Squares

minus

Perfect square − Perfect square

Factor each binomial.

a) $36x^2 - 25$

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

b) $16x^2 - 49y^2$

$(4x + 7y)(4x - 7y)$

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

$3a(a^2 - 4b^2)$ difference of squares

GCF

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

d) $x^4 - 16$

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

doesn't factor (sum of squares)

difference of squares

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

e) $(x+y)^2-64$

$(x+y+8)(x+y-8)$

f) $(x+1)^2-(y+3)^2$

$(x+1+y+3)(x+1-(y+3))$

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

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

* Brackets after a minus sign

g) $x^{2n}-25$

$(x^n-5)(x^n+5)$

$x^n \cdot x^n$ add exponents

x^{n+n}

x^{2n}

Try

x^2-9 $(x-3)(x+3)$

$2x^2-32$

$2(x^2-16)$

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

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#5 b, d, h, i, j, m, n, p
6 a, c, g
7 e, f, j
Try 9 a, f