Algebra 1

Lesson 9.7

Factor Special Products

Warm-Up

Multiply each of the following.

(a) $(x+5)(x-5)$ x^2-25

(b) $(z-4)(z+4)$ z^2-16

(c) $(2y+1)(2y-1)$ $4y^2-1$

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

(e) $(b-3)^2$ b^2-6b+9

(f) $(2t+5)^2$ $4t^2+20t+25$

Example 1. Factor the Difference of Two Squares

Factor the polynomial.

(a) y^2-9 $(y+3)(y-3)$

(b) x^2-36 $(x+6)(x-6)$

(c) b^2-16 $(b+4)(b-4)$

Example 2. More Difference of Two Squares

Factor the polynomial.

(a) $16x^2-25$ $(4x+5)(4x-5)$

(b) $8-18n^2$ $2(4-9n^2)$ $2(2+3n)(2-3n)$

(c) $9b^2-49$ $(3b+7)(3b-7)$

Try It!

Factor.

(a) x^2-1 $(x+1)(x-1)$

(b) m^2-49 $(m+7)(m-7)$

(c) $2t^2-32$ $2(t^2-16)$ $2(t+4)(t-4)$

(d) $4x^2-121$ $(2x+11)(2x-11)$

Example 3. Factor Perfect Square Trinomials

Factor the polynomial.

(a) a^2+6a+9

$(a+3)(a+3)$

$(a+3)^2$

(b) $9x^2-12x+4$

$(3x-2)(3x-2)$

$(3x-2)^2$

(c) $-2n^2-16n-32$

$-2(n^2+8n+16)$

$-2(n+4)^2$

Example 4. Factoring and Solving Practice

Solve each equation by factoring.

(a) $4w^2-36=0$

$4(w^2-9)=0$

$4(w+3)(w-3)=0$

$w=3,-3$

$w=\pm 3$

(b) $d^2+49=14d$

$d^2-14d+49=0$

$(d-7)^2=0$

$d=7$

KEY CONCEPT *For Your Notebook*

Difference of Two Squares Pattern

Algebra	Example
$a^2-b^2=(a+b)(a-b)$	$4x^2-9=(2x)^2-3^2=(2x+3)(2x-3)$

KEY CONCEPT *For Your Notebook*

Perfect Square Trinomial Pattern

Algebra	Example
$a^2+2ab+b^2=(a+b)^2$	$x^2+6x+9=x^2+2(x\cdot 3)+3^2=(x+3)^2$
$a^2-2ab+b^2=(a-b)^2$	$x^2-10x+25=x^2-2(x\cdot 5)+5^2=(x-5)^2$

Assignment

New: Pg. 603 #4 - 30 (evens)

Review:

Factor completely.

1. $4x-12x^3$
2. $x^2-4x-60$
3. $5a^2b^4+20a^3b^2$
4. $2x^2-3x-20$
5. $6x^2-5x-4$
6. $8x^4-16x^2+20x$
7. x^2+x+6
8. $3(y-1)+x(y-1)$