8.7 Factoring Special Cases

Warm Up

Multiply

1. (3x - 5)(3x + 5)

$9x^2+15x-15x-25$

$9x^2-25$

2. (3x - 5)(3x - 5)

$9x^2-15x-15x+25$

$9x^2-30x+25$

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8.7 Factoring Special Cases

We will be factoring

1. **Difference of Two Squares**
2. **Perfect-Square Trinomials**

Both of these have **perfect squares** in them.

First you have to recognize perfect squares.

$1=1^2$ $4=2^2$ $9=3^2$ $16=4^2$

25 36 49 64

81 100 121 144

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Difference of Perfect Squares

$a^2 - b^2$

They are factored as

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

ex. $x^2 - 64 = (x + 8)(x - 8)$

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Factor.

$x^2 - 36$

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

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Factor

$25x^2 - 36$

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

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Factor.

$16x^2 - 25y^2$

$(4x+5y)(4x-5y)$

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Factor completely.

$$\frac{5x^2}{5} - \frac{20}{5}$$

$5(x^2 - 4)$

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

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Factor completely.

$$\frac{4x^3}{4x} - \frac{36x}{4x}$$

$4x(x^2 - 9)$

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

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Perfect-Square Trinomials are of the form

$$a^2 \pm 2ab + b^2$$

They are factored as

$$(a \pm b)(a \pm b)$$

ex. $x^2 + 8x + 16 = (x + 4)(x + 4)$

$2 * 1 * 4 = 8$

$x^2 + 4x + 4x + 16$

$x^2 + 8x + 16$

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Factor

$$x^2 - 12x + 36$$

$(x-6)(x-6)$

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Factor

$$y^2 + 2y + 1$$

$(y+1)(y+1)$

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Factor

$$64x^2 + 112x + 49$$

$2(8)(7) = 112$

$(8x+7)(8x+7)$

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Solve for x.

$25x^2 - 40x + 16 = 0$

$(5x-4)(5x-4) = 0$

$5x - 4 = 0$
$+4 \quad +4$
$\frac{5x}{5} = \frac{4}{5}$

$x = \frac{4}{5}$

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Solve for x.

$9x^2 - 25 = 0$

$(3x-5)(3x+5) = 0$

$3x - 5 = 0$ or $3x + 5 = 0$
$+5 \quad +5 \qquad -5 \quad -5$

$x = \frac{5}{3}$ or $\frac{-5}{3}$

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Solve for x.

$\frac{-3x^2}{-3} + \frac{36x}{-3} \frac{-108}{-3} = 0$

$-3(x^2 - 12x + 36) = 0$

$-3(x-6)(x-6) = 0$

$x - 6 = 0$

$x = 6$

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Solve for x.

$-6x^2 = -864$
$+864 \quad +864$

$\frac{-6x^2}{-6} + \frac{864}{-6} = 0$

$-6(x^2 - 144) = 0$

$-6(x+12)(x-12) = 0$

$x = -12$ or 12

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Classwork: **p.545 #4 - 32 even**

Final Five

What is the factored form of $4x^2 - 20x + 25$?

a. (2x + 5)(2x - 5) **b**. (2x - 5)(2x - 5)

c. (4x - 5)(4x - 5) **d**. (4x + 5)(4x - 5)

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