Unit 19
Factoring

Math Essentials

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Practice 19.1

Find the greatest common factor (GCF).

1. $8, 12$
2. $8xy^2, 12x^3$
3. $12a, 30a^2, 42ab$

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Practice 19.2

Factor the following expressions.

1. $8a - 20$
2. $8xy^2 + 12x^3$

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Factoring out the GCF

Step 1 Identify the GCF of all terms of the polynomial.

Step 2 Write each term as the product of the GCF and another factor.

Step 3 Use the distributive property to remove the GCF.

Note: To check, multiply!

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Practice 19.2

Factor the following expressions.

1. $8a - 20$
2. $8xy^2 + 12x^3$
3. $12a + 30a^2 - 42ab$
4. $6uv^4y^2 - 21u^8v^9$

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Factoring by Grouping

Step 1 Split the expression down the middle and factor out the GCF from each pair of terms.

Step 2 Factor out the binomial factor.

Note: If the signs in the binomial factors are switched, go back and factor out the OPPOSITE of one GCF.

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Practice 19.4

Factor the following expressions.

1. $x^2 + 4x + 3$
2. $x^2 + 5x + 6$
3. $x^2 - 7x + 12$

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Factoring Trinomials

$x^2 + 10x + 24$

a=1 b=10 c=24

FACTORS of 24	SUM of 10
1,24	25 X
2,12	14 X
3,8	11 X
4,6	10 ✓

$(x+4)(x+6)$

MANEUVERING THE MIDDLE

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Factoring Trinomials

Case 1 If *c* is *positive*, then the signs must be the same.

c is positive.

$x^2 + 6x + 8$

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

Same signs

c is positive.

$x^2 - 6x + 8$

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

Same signs

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Factoring Trinomials

Case 2 If *c* is *negative*, then the signs must be different.

c is negative.

$x^2 + 2x - 35$

$(x + 7)(x - 5)$

Different signs

c is negative.

$x^2 - 2x - 35$

$(x - 7)(x + 5)$

Different signs

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Practice 19.5

Factor the following expressions.

1. $2w^2 - 20w + 70$
2. $x^2 + 8x + 16$
3. $x^2 - 9$
4. $x^2 + 9$

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Special Cases of Factoring

Difference of Squares

$a^2 - b^2 = (a + b)(a - b)$

Sum of Squares

$a^2 + b^2$ is NOT factorable

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