

3.3 Common Factors of a Polynomial

Lesson 4 - 5

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Connect DEFINITIONS:

ALGEBRA TILES

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Connect Factoring Polynomials

In Arithmetic

We **multiply** factors to form a product

$$(3)(5) = 15$$

factors product

We **factor** a number by expressing it as a product of factors.

$$15 = (3)(5)$$

number factors

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Connect Factoring Polynomials

In Algebra

We **expand** an expression to form a product

$$4(x + 2) = 4x + 8$$

factors product

We **factor** a polynomial by expressing it as a product of factors.

$$6x + 12 = 6(x + 2)$$

number factors

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Connect EXAMPLE 1:

Factor the binomial $6n + 9$

Find the GCF in each term.

$$\begin{array}{cc} \overset{6}{\uparrow} & \overset{9}{\uparrow} \\ 2 \cdot 3 \cdot n & 3 \cdot 3 \\ \text{GCF} = 3 \end{array}$$

$$\frac{6n+9}{3} = \frac{6n}{3} + \frac{9}{3}$$

$$= 2n+3$$

Factors $3(2n+3)$

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Connect EXAMPLE 2:

Factor the binomial $6c + 4c^2$

Find the GCF in each term.

$$\begin{array}{cc} \overset{6}{\uparrow} & \overset{4}{\uparrow} \\ 2 \cdot 3 \cdot c & 2 \cdot 2 \cdot c \cdot c \\ \text{GCF} = 2c \end{array}$$

$$\frac{4c^2+6c}{2c} = \frac{4c^2}{2c} + \frac{6c}{2c}$$

Factors: $2c(2c+3) = 2c+3$

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Practice YOU TRY!

Factor each of the following

$3g + 6$	$12d^2 + 8d$
$3(g + 2)$	$4d(3d + 2)$

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Connect EXAMPLE 1:

Factor the trinomial $5 - 10z - 5z^2$

Find the GCF in each term.

$$-5z^2 - 10z + 5$$

$$5(-z^2 - 2z + 1)$$

Better Answer $-5(z^2 + 2z - 1)$

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Practice	YOU TRY!
Factor the trinomial	
$6 - 12z + 18z^2$	
$18z^2 - 12z + 6$	
$6(3z^2 - 2z + 1)$	

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Connect	EXAMPLE 2:
Factor the trinomial $-12x^3y - 20xy^2 - 16x^2y^2$	
$-12x^3y - 20xy^2 - 16x^2y^2$ $-4xy(3x^2 + 5y + 4xy)$	<p style="color: red; margin: 0;">Steps</p> <p>Factor each term in the trinomial</p> <p>Find the GCF from each term</p> <p>Divide each term by the GCF</p>

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Practice	YOU TRY!
Factor the trinomial $-20c^4d - 30c^3d^2 - 25cd$	
$-5cd(4c^3 + 6c^2d + 5)$	<p style="color: red; margin: 0;">Steps</p> <p>Factor each term in the trinomial</p> <p>Find the GCF from each term</p> <p>Divide each term by the GCF</p>

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Practice	YOU TRY!
Factor the trinomial $4x^2y^2 + 12x^2y^2 + 36xy^2$	
$4xy^2(x + 3x + 9)$ $4xy^2(4x + 9)$	<p style="color: red; margin: 0;">Steps</p> <p>Factor each term in the trinomial</p> <p>Find the GCF from each term</p> <p>Divide each term by the GCF</p>

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Practice	HOMEWORK!
Advance Class: Page 155 # 9, 10,11 Page 156 # 16, 18, 21 Worksheet #1	

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