Name _____ Date _____ Class_____

LESSON 7-2

Review for Mastery

Factoring by GCF

The Distributive Property states: $a(b + c) = ab + ac$

Factoring by GCF reverses the Distributive Property:

$$ab + ac = a(b + c)$$

Factor $12x^3 + 21x^2 + 15x$. Check your answer.

Step 1: Find the GCF of all the terms in the polynomial.

The factors of $12x^3$ are: 1, 2, **3**, 4, 6, 12, ***x***, x, x

The factors of $21x^2$ are: 1, **3**, 7, 21, ***x***, x

The factors of $15x$ are: 1, **3**, 5, 15, ***x***

} The GCF is $\mathbf{3x}$.

Step 2: Write terms as products using the GCF.

$12x^3 + 21x^2 + 15x$

$\mathbf{(3x)}4x^2 + \mathbf{(3x)}7x + \mathbf{(3x)}5$

Step 3: Use the Distributive Property to factor out the GCF.

$3x(4x^2 + 7x + 5)$

***Check*:**

$3x(4x^2 + 7x + 5) = 12x^3 + 21x^2 + 15x$ ✓

Factor $5(x - 3) + 4x(x - 3)$.

Step 1: Find the GCF of all the terms in the polynomial.

The factors of $5(x - 3)$ are: 5, $\mathbf{(x - 3)}$

The factors of $4x(x - 3)$ are: 4, x, $\mathbf{(x - 3)}$

} The GCF is $\mathbf{(x - 3)}$.

The terms are already written as products with the GCF.

Step 2: Use the Distributive Property to factor out the GCF.

$(x - 3)(5 + 4x)$

Factor each polynomial.

1. $20x^2 - 15x$ _____
2. $44a^2 + 11a$ _____
3. $24y - 36x$ _____

Factor each expression.

4. $5x(x + 7) + 2(x + 7)$ _____
5. $3a(a + 4) - 2(a + 4)$ _____
6. $4y(4y + 1) + (4y + 1)$ _____

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LESSON 7-2

Review for Mastery

Factoring by GCF continued

When a polynomial has four terms, make two groups and factor out the GCF from each group.

Factor $8x^3 + 6x^2 + 20x + 15$.

Step 1: Group terms that have common factors.

$$(8x^3 + 6x^2) + (20x + 15)$$

Step 2: Identify and factor the GCF out of each group.

$(8x^3 + 6x^2) + (20x + 15)$

GCF is **$2x^2$.** GCF is **5.**

$2x^2(4x + 3) + 5(4x + 3)$

Step 3: Factor out the common binomial factor.

$2x^2\mathbf{(4x + 3)} + 5\mathbf{(4x + 3)}$

GCF is **$(4x + 3)$.** $(4x + 3)\,(2x^2 + 5)$

***Check*:**

$(4x + 3)\,(2x^2 + 5)$

$4x(2x^2) + 4x(5) + 3(2x^2) + 3(5)$ *Use FOIL.*

$8x^3 + 20x + 6x^2 + 15$

$8x^3 + 6x^2 + 20x + 15$ *Rearrange terms.*

Factor each polynomial filling in the blanks.

7. $(18x^3 + 15x^2) + (24x + 20)$

GCF is ☐ GCF is ☐

☐ $(6x + 5)$ + ☐ $(6x + 5)$

(☐) $(6x + 5)$

8. $(10a^3 - 15a^2) + (12a - 18)$

GCF is ☐ GCF is ☐

☐ $(2a - 3)$ + ☐ $(2a - 3)$

(☐) $(2a - 3)$

Factor each polynomial by grouping.

9. $21x^3 + 12x^2 + 14x + 8$

10. $40x^3 - 50x^2 + 12x - 15$