Name: _____ Date: _____

MORE WORK FACTORING TRINOMIALS
COMMON CORE ALGEBRA I

Factoring trinomials, which we first practiced in the last lesson, is a trying experience. All algebra students must learn how to do this procedure because of its immense number of **practical applications**. We will eventually see these applications, but for now, we need to get more practice factoring these trinomials. We begin by looking at a process known as **complete factoring**.

***Exercise* #1:** Consider the trinomial $4x^2 + 20x + 24$.

(a) Write this trinomial as an equivalent expression involving the product of its term's gcf and another trinomial.

(b) Factor this additional trinomial to express the original in **completely factored form**.

Whenever we factor, we should always look to see if a greatest common factor exists that can be "factored out" to begin the problem. This will always make any subsequent factoring easier.

***Exercise* #2:** Rewrite each of the following trinomials in completely factored form.

(a) $10x^2 + 15x - 10$

(b) $3x^3 - 21x^2 + 36x$

(c) $7x^2 + 21x - 70$

(d) $6x^2 - 2x - 4$

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Complete factoring can also involve factoring the **difference of perfect squares**. Try the next exercise to see how this works.

***Exercise* #3:** Write each of the following binomials in completely factored form.

(a) $2x^2 - 18$

(b) $5x^3 - 20x$

(c) $12x^2 - 3$

(d) $54x^2 - 24$

If you understand factoring as breaking an expression into an equivalent product, then essentially you can always check to see if you have factored correctly. Complete factoring actually leads to a nice way to eliminate some guesses from trinomial guess and check methods.

***Exercise* #4:** Consider the trinomial $2x^2 + 11x + 12$.

(a) Do the three terms of this trinomial have a gcf other than 1?

(b) Why would the guesses $(2x+2)(x+6)$, $(2x+4)(x+3)$, and $(2x+12)(x+1)$ not make sense given your answer to (a)?

(c) Fill in the statement:

If a trinomial does not have a gcf, then _____ of its _____ factors will have a gcf.

(d) Factor this trinomial by limiting your guesses.

***Exercise* #5:** Use the Smart Guessing Tip from the last problem to factor $4x^2 - 21x - 18$.

Name: _____ Date: _____

MORE WORK FACTORING TRINOMIALS
COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

1. Rewrite each of the following trinomials in completely factored form.

(a) $2x^2 + 20x + 42$

(b) $6x^2 + 33x + 15$

(c) $5x^2 - 10x - 40$

(d) $30x^2 + 20x - 10$

(e) $x^3 + 7x^2 + 10x$

(f) $4x^3 + 10x^2 - 24x$

(g) $5x^2 - 45$

(h) $2x^3 - 2x$

(i) $36 - 4x^2$

(j) $20x^2 - 125$

2. Which of the following is *not* a factor of $4x^3 + 12x^2 - 72x$? Show work that justifies your choice.

(1) $(x + 9)$

(2) $4x$

(3) $(x - 3)$

(4) $(x + 6)$

3. Which of the following is the missing factor in the product $2(x-1)(\quad ?\quad)$ if it is equivalent to the trinomial $2x^2+10x-12$?

(1) $x+12$ (3) $x+3$

(2) $x+6$ (4) $x-5$

4. Use the Smart Guessing Tip from Exercise #4 to help factor the following challenging trinomials. Note that they do **not** have a greatest common factor.

(a) $4x^2+19x+12$ (b) $6x^2+7x-24$

REASONING

5. Consider the **cubic trinomial** x^3+8x^2+7x.

(a) Write this trinomial as an equivalent product in completely factored form.

(b) How can the original trinomial and your answer to (b) help you determine the value of $(10)(17)(11)$ without a calculator? What is the value?

6. Use the complete factorization of $2x^3+8x^2+8x$ to determine the value of the product $(20)(12)^2$. Explain your reasoning.