Name: **Key**

Date: _____

FACTORING
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. Rewrite each of the following binomials as the product of an integer with a different binomial.

   (a) $10x - 55$ GCF = 5

   $5(2x - 11)$

   (b) $24x - 40$ GCF = 8

   $8(3x - 5)$

   (c) $6x - 45$ GCF = 3

   $3(2x - 15)$

   (d) $18x - 9$ GCF = 9

   $9(2x - 1)$

2. Rewrite each of the following binomials as the product of its gcf along with another binomial.

   (a) $2x^2 - 8x$ GCF = 2x

   $2x(x - 4)$

   (b) $6x + 27$ GCF = 3

   $3(2x + 9)$

   (c) $30x^2 - 35x$ GCF = 5x

   $5x(6x - 7)$

   (d) $24x^3 + 20x^2$ GCF = $4x^2$

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

3. Rewrite each of the following binomials as the product of a conjugate pair.

   (a) $x^2 - 121$

   $(x + 11)(x - 11)$

   (b) $64 - x^2$

   $(8 - x)(8 + x)$

   (c) $4x^2 - 1$

   $(2x + 1)(2x - 1)$

   (d) $25x^2 - \dfrac{1}{9}$

   $\left(5x + \dfrac{1}{3}\right)\left(5x - \dfrac{1}{3}\right)$

4. Rewrite each of the following trinomials as the product of its gcf and another trinomial.

   (a) $4x^2 + 12x + 28$ GCF = 4

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

   (b) $6x^2 - 4x + 10$ GCF = 2

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

   (c) $14x^3 + 35x^2 - 7x$ GCF = 7x

   $7x(2x^2 + 5x - 1)$

   (d) $20x^3 - 5x^2 + 15x$ GCF = 5x

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

5. Completely factor each of the following binomials using a combination of gcf factoring and conjugate pairs.

   (a) $6x^2 - 150$

   $6(x^2 - 25)$

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

   (b) $36 - 4x^2$

   $4(9 - x^2)$

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

   (c) $28x^2 - 7$

   $7(4x^2 - 1)$

   $7(2x + 1)(2x - 1)$

   (d) $27x^3 - 12x$

   $3x(9x^2 - 4)$

   $3x(3x + 2)(3x - 2)$

   (e) $80 - 125x^2$

   $5(16 - 25x^2)$

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

   (f) $2x^3 - 200x$

   $2x(x^2 - 100)$

   $2x(x + 10)(x - 10)$

   (g) $8x^2 - 512$

   $8(x^2 - 64)$

   $8(x + 8)(x - 8)$

   (h) $44x - 99x^3$

   $11x(4 - 9x^2)$

   $11x(2 + 3x)(2 - 3x)$

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6. When completely factored, the expression $48 - 3x^2$ is written as

(1) $3(16-x)(16+x)$ (3) $3(x-4)(x+4)$ $3(16-x^2)$

(2) $3(x-16)(x+16)$ (4) $3(4-x)(4+x)$ $3(4+x)(4-x)$

4.

7. Which of the following represents the greatest common factor of the terms $4x^2y^6$ and $18xy^5$?

(1) $36xy$ (3) $2xy^5$ $4x^2y^6 = ②·2·ⓧ·x·Ⓨ·Ⓨ·Ⓨ·Ⓨ·Ⓨ·Ⓨ·y$

(2) $4x^2y^3$ (4) $2x^2y^2$ $18xy^5 = ②·3·3·ⓧ·Ⓨ·Ⓨ·Ⓨ·Ⓨ·Ⓨ$

3.

8. Which of the following is *not* a factor of $6x^2 - 18x$?

(1) $x-3$ ✓   (3) 12 $6x(x-3)$

(2) 2 ✓   (4) x ✓ $= 2·3·x·(x-3)$

3.

9. Which of the following prime numbers is *not* a factor of the integer 330?

(1) 11   (3) 3 $\dfrac{330}{11} = 30$, $\dfrac{330}{3} = 110$

(2) 7   (4) 5 $\dfrac{330}{5} = 66$, $\dfrac{330}{7} = 47.14...$

2.

APPLICATIONS

10. The area of any rectangular shape is given by the product of its width and length. If the area of a particular rectangular garden is given by $A = 15x^2 - 35x$ and its width is given by $5x$, then find an expression for the garden's length. Justify your response.
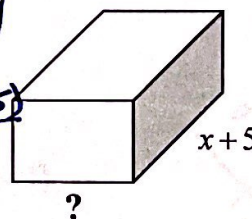
$A = lw$ ∴ $l = \dfrac{A}{w}$ $\dfrac{15x^2 - 35x}{5x} = \boxed{3x - 7}$

11. The volume of a particular rectangular box is given by the equation $V = 50x - 2x^3$. The height and length of the box are shown on the diagram below. Find the width of the box in terms of x. Recall that $V = L \cdot W \cdot H$ for a rectangular box.

$V = L \cdot w \cdot h$ ∴ $w = \dfrac{V}{L \cdot h}$ $w = \dfrac{50x - 2x^3}{2x(x+5)}$ $= \boxed{x-5}$

$w = \dfrac{2x(25 - x^2)}{2x(x+5)} = \dfrac{2x(x+5)(x-5)}{2x(x+5)}$

$x+5$, $2x$, $?$

12. A projectile is fired from ground level such that its height, h, as a function of time, t, is given by $h = -16t^2 + 80t$. Written in factored form this equation is equivalent to

(1) $h = -16t(t+4)$ (3) $h = -16t(t-5)$ $h = -16t(t-5)$

(2) $h = -8t(2t-7)$ (4) $h = -8t(t-5)$

3.

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