Name:_____ Date:_____

Algebra II Lesson 1-2

FACTORING REVIEW

FACTOR – TWO IMPORTANT MEANINGS

(1) **Factor** (*verb*) – To rewrite a quantity as an equivalent product.
(2) **Factor** (*noun*) – Any individual component of a product.

Always keep in mind that when we **factor (*verb*)** a quantity, we are simply rewriting it in a different form that is completely equal to the original quantity.

GCF: Greatest Common Factor

What to look for:

Always look for this first – the terms will have a common factor

Directions: Factor each of the following expressions by "factoring out" the greatest common factor (GCF). The greatest common factor can be comprised of numbers, variables, or both.

(a) $6-14x$ $2(3-7x)$

(b) $30x^2-20$ $10(x^2-2)$

(c) $24x^3+20x^2$ $4x^2(6x+5)$

DOTS: Difference Of Two Squares

What to look for:

1. Binomial
2. Subtraction
3. Perfect Square coefficients, constant terms, numerators and denominators of fractions. Even exponents for variable terms.

***Directions*:** Express each of the following binomials as the difference of perfect squares (DOTS).

(a) $4x^2-25$ $(2x+5)(2x-5)$

(b) $16-81x^2$ $(4+9x)(4-9x)$

(c) $36x^2-49y^2$ $(6x+7y)(6x-7y)$

(d) y^4-100 $(y^2+10)(y^2-1)$

TRAM: TRinomial Add Multiply

What to look for: Trinomial (3 terms)

In Calc: $Y_1 = \#/X$

***Directions*:** Factor each of the following trinomials by using TRAM.
The easiest of all trinomial factoring occurs when the leading coefficient is one $(a=1)$. $Y_2 = X + Y_1$

(a) $x^2 - 11x + 28$

28 : $-7 \cdot -4$, $-7 + -4 = -11$

$(x-7)(x-4)$

(b) $x^2 - 5x - 50$

-50 : $-10 \cdot 5$, $-10 + 5 = -5$

$(x-10)(x+5)$

(c) $x^4 + 2x^2 - 35$

-35 : $7 \cdot -5$, $7 + -5 = 2$

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

Factoring Completely

1) Greatest Common Factor (GCF)

2a) Binomial (Two Terms) **Check for DOTS**

2b) Trinomial (Three Terms) **Check for TRAM**

3) Check to see if you can **factor again** by **DOTS**

***Directions*:** Using a combination of **gcf** , **difference of perfect squares factoring**, and/or **tram factoring.** Write each of the following in its completely factored form.

(a) $-x^2 + 13x - 22$

22 : $-11 \cdot -2$, $-11 + -2 = 13$

$-1(x^2 - 13x + 22)$ GCF

$-1(x-11)(x-2)$ TRAM

(b) $28x^2 - 7$

$7(4x^2 - 1)$ GCF

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

(c) $x^5 - 1x$

$x(x^4 - 1)$ GCF

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

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

(d) $x^4 - 13x^2 + 36$

36 : $-4 \cdot -9$, $-4 + -9 = -13$

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

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

Name: Key Date:

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FACTORING REVIEW PRACTICE QUESTIONS
FACTOR EACH OF THE FOLLOWING EXPRESSIONS

1) $x^2 - 13x + 22$

A M

$(x-11)(x-2)$ TRAM

2) $\frac{1}{49}x^2 - 121$

$(\frac{1}{7}x+11)(\frac{1}{7}x-11)$ DOTS

3) $-x^2 + 5x - 6$

A M

$-1(x^2-5x+6)$ GCF

$-1(x-2)(x-3)$ TRAM

4) $27x^3 - 12x$

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

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

5) $10x^2 + 100x + 250$

A M

$10(x^2+10x+25)$ GCF

$10(x+5)(x+5)$ TRAM

$10(x+5)^2$

6) $x^8 - 16$

$(x^4+4)(x^4-4)$ DOTS

$(x^4+4)(x^2+2)(x^2-2)$ DOTS

7) $4x^4 - 64$

$4(x^4-16)$ GCF

$4(x^2+4)(x^2-4)$ DOTS

$4(x^2+4)(x^2+2)(x^2-2)$ DOTS

8) $343x^2 - 7x^4$

$7x^2(49 - x^2)$ GCF

$7x^2(7 - x)(7 + x)$ DOTS

A M

9) $x^4 + 4x^2 - 5$

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

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

10) Challenge Question: $x^{2a} + 4x^a - 32$

$(x^a + 8)(x^a - 4)$ TRAM

PRACTICE ANSWERS

1. TRAM $(x - 11)(x - 2)$ ✔
2. DOTS $(\frac{1}{7}x - 11)(\frac{1}{7}x + 11)$ ✔
3. GCF→TRAM $-1(x - 2)(x - 3)$ ✔
4. GCF→DOTS $3x(3x + 2)(3x - 2)$ ✔
5. GCF→TRAM $10(x + 5)^2$ ✔
6. DOTS→DOTS $(x^2 + 2)(x^2 - 2)(x^4 + 4)$ ✔
7. GCF→DOTS→DOTS $4(x - 2)(x + 2)(x^2 + 4)$ ✔
8. GCF→DOTS $7x^2(7 - x)(7 + x)$ ✔
9. TRAM→DOTS $(x^2 + 5)(x - 1)(x + 1)$ ✔
10. TRAM $(x^a + 8)(x^a - 4)$ ✔