

Unit 2

Lesson 6

Factoring

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Factoring

**Finding a
Greatest Common
Factor (GCF)**

-Common
factor for each
term

2 TERMS

Difference of Squares
 $a^2 - b^2 = (a-b)(a+b)$
 $a^2 + b^2 = \text{Prime}$

3 TERMS

$x^2 + bx + c$
 unfoil factors of "c" so they
 multiply to c & sum to b

 $ax^2 + bx + c$
 "Slide & divide"
 Slide, Factor, Reduce, Slide
 denominators

→ Group by two's
 → Find GCF for each group
 → Obtain matching parentheses


1. If a polynomial can not be factored, it is Prime. 2. Always check for a GCF first!!!

3. Count the number of terms to see which method to try. 4. Always check to see if your polynomial can be factored further.

5. You can always check your factors by multiplying the factors back together.

Honors
Quadratic Functions
- Factoring

Date: _____



I. Greatest Common Factor (GCF) → if possible, always do this FIRST.

A. $24a^2b - 18ab^2$

$6ab(4a - 3b)$

B. $5x^2y - 20xy^2z + 35y^3z^2$

$5y(x^2 - 4xyz + 7y^2z^2)$

C. $2x^3yz^3 - 7xy^5z^2$

$xyz^2(2x^2z - 7y^4)$

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I. Factoring 4 term polynomials → Group by 2's

A. $4x - 20 + 3xy - 15y$

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

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

C. $3a^2 - ab - 12a + 4b$

$$a(3a-b) - 4(3a-b)$$

$$(a-4)(3a-b)$$

B. $15ab^2 - 3a + 10b^2 - 2$

$$3a(5b^2-1) + 2(5b^2-1)$$

$$(3a+2)(5b^2-1)$$

D. $16x^3 - 128x^2 + 2x - 16$

$$2(8x^3 - 64x^2 + x - 8)$$

$$2(8x^2(x-8) + 1(x-8))$$

$$2(8x^2+1)(x-8)$$

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II. Difference of Two Squares Factoring → $a^2 - b^2 = (a - b)(a + b)$ *** Always check for a GCF first!!!!

A. $x^2 - 9$

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

B. $x^2 - 49$

$$(x-7)(x+7)$$

C. $x^2 - 36y^2$

$$(x-6y)(x+6y)$$


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A. $x^2 - 9$	B. $x^2 - 49$	C. $x^2 - 36y^2$
D. $16x^2 - 1$ $(4x-1)(4x+1)$	E. $x^2 + 25$ Not a diff of squares	F. $-1 + x^2$ Tricky $x^2 - 1$ $(x-1)(x+1)$

$16x^2 - 4x + 4x - 1$

$16x^2 - 1$

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G. $24x^5 - 54xy^6$ $6x(4x^4 - 9y^6)$ $6x(2x^2 - 3y^3)(2x^2 + 3y^3)$	H. $4x^2 - 64$ $4(x^2 - 16)$ $4(x - 4)(x + 4)$	I. $x^4 - 16$ $(x^2 - 4)(x^2 + 4)$
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III. Factoring Trinomials \rightarrow $x^2 + bx + c$ "SHORTCUT" *** Always check for a GCF first!!!

A. $x^2 + 9x + 20$

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

B. $x^2 - 7x + 10$


$(x-2)(x-5)$

C. $x^2 + 3x - 40$

$(x-5)(x+8)$

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<p>A M D. $x^2 - 3x - 10$ $(x - 5)(x + 2)$</p>	<p>E. $2x^2 - 8x - 90$ $2(x^2 - 4x - 45)$ $2(x - 9)(x + 5)$</p>	<p>A M F. $x^4 - 7x^2 + 12$ $(x^2 - 3)(x^2 - 4)$</p>
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IV. Factoring Trinomials $\rightarrow \boxed{ax^2 + bx + c}$ *** Always check for a GCF first!!!!

<p>A. $2x^2 + 7x + 6$</p> <p>$x^2 + 7x + 12$</p> <p>$(x+4)(x+3)$</p> <p>$(x+2)(2x+3)$</p> <p>$2x^2 + 3x + 4x + 6$</p>	<p>B. $2x^2 - 9x + 4$</p> <p>$x^2 - 9x + 8$</p> <p>$(x-8)(x-1)$</p> <p>$(x-4)(2x-1)$</p> <p>$2x^2 - x - 8x + 4$</p>	<p>C. $3x^2 + 5x + 2$</p> <p>$x^2 + 5x + 6$</p> <p>$(x+2)(x+3)$</p> <p>$(3x+2)(x+1)$</p> <p>$3x^2 + 3x + 2x + 2$</p> <p>$3x^2 + 5x + 2$</p>
<p>$2x^2 + 7x + 6$</p>	<p>$2x^2 - 9x + 4$</p>	<p>Created with Doceri </p>

<p>D. $6x^2 - 4x - 42$</p> <p>$2(3x^2 - 2x - 21)$</p> <p>$2(x^2 - 2x - 63)$</p> <p>$2(x - 9)(x + 7)$</p> <p>$2(x - 3)(3x + 7)$</p> <p>$(2x - 6)(3x + 7)$</p> <p>$6x^2 - 18x + 14x - 42$</p> <p>$6x^2 - 4x - 42$</p>	<p>E. $6x^2 + 11xy + 4y^2$</p> <p>$x^2 + 11x + 24y^2$</p> <p>$(x + 8y)(x + 3y)$</p> <p>$(x + \frac{4y}{3})(x + \frac{1y}{2})$</p> <p>$(3x + 4y)(2x + y)$</p> <p>$6x^2 + 3xy + 8xy + 4y^2$</p> <p>$6x^2 + 11xy + 4y^2$</p>	<p>F. $5x^4 - 17x^2 + 14$</p> <p>$x^4 - 17x^2 + 14$</p> <p>$(x^2 - 7)(x^2 - 10)$</p> <p>$(5x^2 - 7)(x^2 - 2)$</p> <p>$5x^4 - 10x^2 - 7x^2 + 14$</p> <p>$5x^4 - 17x^2 + 14$</p>
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<p>A. $(x - 4)(3x - 1) = 0$</p> $\begin{array}{l} x - 4 = 0 \\ +4 \quad +4 \\ \hline x = 4 \end{array}$ $\begin{array}{l} 3x - 1 = 0 \\ +1 \quad +1 \\ \hline 3x = 1 \\ \frac{3x}{3} = \frac{1}{3} \\ x = \frac{1}{3} \end{array}$ <p>$x = \underline{\frac{1}{3}, 4}$</p>	<p>B. $x^2 - 5x - 6 = 0$</p> $(x - 6)(x + 1) = 0$ $\begin{array}{l} x - 6 = 0 \\ +6 \quad +6 \\ \hline x = 6 \end{array}$ $\begin{array}{l} x + 1 = 0 \\ -1 \quad -1 \\ \hline x = -1 \end{array}$ <p>$x = \underline{-1, 6}$</p>	<p>C. $3x^2 - 5x + 2 = 0$</p> $x^2 - 5x + 6 = 0$ $(x - \frac{3}{3})(x - \frac{2}{3}) = 0$ $(x - 1)(3x - 2) = 0$ $\begin{array}{l} 3x - 2 = 0 \\ +2 \quad +2 \\ \hline 3x = 2 \\ \frac{3x}{3} = \frac{2}{3} \\ x = \frac{2}{3} \end{array}$ $\begin{array}{l} x - 1 = 0 \\ +1 \quad +1 \\ \hline x = 1 \end{array}$ <p>$x = \underline{\frac{2}{3}, 1}$</p>
<p>$x = \frac{2}{3}$</p>		
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<p>D. $x^2 - 3x = 0$</p> <p>$x(x-3) = 0$</p> <p>$x = 0$ $x - 3 = 0$ $+3$ $+3$</p> <p>$x = 3$</p> <p>$x = \underline{0, 3}$</p>	<p>E. $x^2 = 36$</p> <p>$x^2 - 36 = 0$</p> <p>$(x-6)(x+6)$</p> <p>$x - 6 = 0$ $x + 6 = 0$ $+6$ $+6$ -6 -6</p> <p>$x = 6$ $x = -6$</p> <p>$x = \underline{-6, 6}$</p>	<p>F. $x^3 - 3x^2 = 10x$</p> <p>$x^3 - 3x^2 - 10x = 0$</p> <p>$x(x^2 - 3x - 10) = 0$</p> <p>$x(x-5)(x+2) = 0$</p> <p>0 5 -2</p> <p>$x = \underline{-2, 0, 5}$</p>
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Extra Practice for Quiz

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