

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**AIM:** How do we factor non-linear algebraic expressions?

**Simplify each expression.**

1.) $x^3 \cdot x^4$	2.) $3x^2 \cdot 2x^5$	3.) $x \cdot x$	4.) $6x \cdot 2x$
5.) $\frac{x^4}{x^2}$	6.) $2(x + 3)$	7.) $-3(x^2 + 2x - 1)$	8.) $4x(x - 5)$

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**Non-linear Algebraic Expression:**

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**Simplify each expression using the distributive property. Remember to use the Laws of Exponents!**

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

$$4x(x + 5) = 4x^2 + 20x$$



Factor out the GCF of  $4x^2 + 20x$

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First Factor:

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Second Factor:

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1.) Factor: $5x^2 + 3x$  _____ (_____)	4.) Factor: $6x^6 + 72x^4 - 12x^3$  _____ (_____)
2.) Factor: $12x^2y + 8x^3y^2$  _____ (_____)	5.) Factor: $5x^2y^3 - 10x^4y^2 + 15xy$  _____ (_____)
3.) Factor: $18ab^3 + 30a^3b^3$  _____ (_____)	6.) Factor: $16a^4b^2 - 4ab$  _____ (_____)

7.) Factor  $2x^6 + 10x^4 - 12x^3$

\_\_\_\_\_ (\_\_\_\_\_)

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8.) Factor:  $45x^2y^3 - 15xy^2 + 30xy$

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9.) Factor:  $4x^5 + 2x^4 + 12x^3$

\_\_\_\_\_ (\_\_\_\_\_)



1.) What is the difference between a linear algebraic expression and a nonlinear algebraic expression?

2.) Factor  $8x^2 + 8x$