**Unit 1: Algebraic Expressions**

**Lesson 2: Multiply Polynomials**

**Objectives:**

* **I can use the laws of exponents to multiply and divide polynomials**
* **I can use the distributive property and double distribution to simplify algebraic expressions.**
* **I can translate expressions to algebraic terms**

**Agenda:**

* **Video 1**
* **Practice**
* **Video 2**
* **Practice**
* **Challenge yourself: Area**

**Vocabulary:**

* **Laws of exponents, distribution, double distribution.**

**Focus Questions:**

1. **What do you do with exponents when you multiply polynomials?**
2. **Why is multiplying a binomial by another binomial called “double distribution”?**

**Web Support:**

* [https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-monomials/v/multiply-monomials-intro](https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-polynomials-by-monomials/v/multiplying-monomials-by-polynomials)
* <https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-polynomials-by-monomials/v/multiplying-monomials-by-polynomials>
* [https://](https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-monomials/v/multiplying-and-dividing-monomials-1)

**Online Practice:**

* <http://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-monomials/e/finding-the-product-of-two-monomials>

**Homework: Finish your practice**

**Quiz on Lesson 1-1 and 1-2 at the end of the week.**

**How well did you do with the last lesson?**



**Adding polynomials: Write down the rule and give an example**

**Like Terms: Define it and give an example**

**Subtracting Polynomials: Rule and example**

**Answer the following questions: Review Exponents:**

**Explain what we need to do based on the laws of exponents:**

1. What do we do with exponents when we multiply algebraic expressions with similar bases?

1. What do we do with exponents when we divide algebraic expressions with similar bases?
2. What do we do with exponents when we raise an algebraic expression with an exponent to another exponent?
3. What is the outcome when we raise a variable to a 0 power?
4. What is the outcome when we raise a variable to a 1 power?
5. How can we simplify an expression with a negative exponent to a an expression with a positive exponent?

**Practice:**

**Use the law of exponents to simplify the following:**

* + - 1. 2. **** 3. $x^{0} ∙ x^{3}=$
1. $(x^{3})^{4}=$ 5. $d^{1}=$ 6. $y^{4} ∙ y^{9}=$

7. $\frac{x^{10}}{x^{4}}=$ 8. $z^{1} ∙ z^{7}=$ 9. $(y^{5})^{2}=$

**Write the following expression with positive exponents:**

10. $4^{-2}=$ 11. $x^{-2}=$

12. $2^{-3}=$ 13. $y^{-10}=$

**Use all your skills:**

14. $x^{0} (3x^{6}) (-2x^{4})=$ 15. $3^{1} ∙ 3^{2}∙ 3^{4}=$

16. $\frac{y^{5}∙ y^{2}}{y^{1}}=$ 17. $ x^{2}∙(x^{5})^{3}=$

18. $ \left(3xy\right)\left(-5x^{4}y^{3}\right)=$ 19. $\frac{-6y^{7}}{3y^{-2}}=$

20. $\frac{-9 x^{6}y^{4}}{3x^{2}y^{2}}=$ 21. $\frac{y^{2a} ∙ y^{3a}}{y^{a}}=$

22. $-2x\left(x^{2}-4x+7\right)=$ 23. $3xy\left(x^{2}y+4xy^{2}+3y\right)=$

**Find the product: Use the distributive law:**

24. $3\left(2x-5\right)= $ 25. $ -6\left(x+4\right)= $ 26. $3x\left(2x+9\right)=$

**Multiply the following binomials: Express the product as a trinomial:**

27. $\left(z+3\right)\left(z+1\right)= $ 28. $ \left(a-2\right)\left(a+7\right)=$

29. $\left(p-4\right)\left(p+4\right)= $ 30. $ \left(x + 3\right)\left(x - 4\right)=$

2*x* 5*x* 33*x* 52*x* 4

2*x* 12*x* 1$(a +2)^{2} is \left(a+2\right)\left(a+2\right)=$



**Challenge yourself; When do I ever need this?**

**Word Problems:**

39. If the length of a square can be represented by the monomial 3*x*

(a) Express the perimeter of the square in term of x.

40. The width of a rectangle is represented by *w*. The length is three more than twice the width.

(b) Express the area of the rectangle as a binomial in terms of *w*.

1. Write a variable expression for the area of a square whose side is x + 8 in terms of x.

42. The length of a rectangle is  and its width is . Express the area of the rectangle in terms of x.

1. Express the following as trinomials:

$a. \left(x + 4\right)^{2}=$ $b. \left(x-5\right)(x^{2}+3x-1)=$