

Your Name

Mrs. T

2/22/21

Notes

Lesson 7.2

Multiplying Polynomials by Monomials

Objective: To be able to multiply a polynomial by a monomial using distribution and exponent rules.

Life Lesson/Math Skill: Once we know how to distribute a monomial to a polynomials then we multiply any size polynomial by any size polynomial using distribution. Then we can do it backwards and factor!

Recall: Distributive Property- when a number on the outside of parenthesis is multiplied to each number or variable separated by an addition/subtraction sign within the parenthesis.

$$3(x + 2) \Rightarrow 3x + 6$$

Multiply using Distribution-

When a monomial outside parenthesis is multiplied to each term inside the parenthesis.

*Remember, when variables are multiplied it will effect the exponents. *addition*

$x(5x + x^2)$
 $x \cdot 5x + x \cdot x^2$
 $5x^2 + x^3$

$2y = y + y$
 $y^2 = y \cdot y$

$-2xy(2y + 4x^2)$
 $-2x \cdot y \cdot 2y + -2x \cdot y \cdot 4x^2$
 $-2 \cdot 2 \cdot x \cdot y \cdot y + -2 \cdot 4 \cdot x \cdot x \cdot x \cdot y$
 $-4xy^2 - 8x^3y$

$-3x(4x^2 - 5x + 2)$
 $-3x \cdot 4x^2 + -3x \cdot -5x + -3x \cdot 2$
 $-12x^3 + 15x^2 - 6x$

$2x^2y^2(3xy + 2y + 5x)$
 $2x^2y^2 \cdot 3xy + 2x^2y^2 \cdot 2y + 2x^2y^2 \cdot 5x$
 $2 \cdot 3 \cdot x^2 \cdot x \cdot y^2 \cdot y + 2 \cdot 2 \cdot x^2 \cdot y^2 \cdot y + 2 \cdot 5 \cdot x^2 \cdot x \cdot y^2$
 $6x^3y^3 + 4x^2y^3 + 10x^3y^2$

Simplifying -Distributing (add exponents) and combining like terms

Let's take turns!

Ex. $x(3x - 4) - 5x$

$$x \cdot 3x - x \cdot 4 - 5x$$

$$3x^2 - 4x - 5x$$

$$3x^2 - 9x$$

Ex. $-x(3x - 4) - 5x$

$$-x \cdot 3x + -x \cdot -4 - 5x$$

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

$$-3x^2 - 1x$$

Ex. $6x^2(3x^2 + 2x - 6) - 3x(2x + x^2 + 3)$

$$18x^4 + 12x^3 - 36x^2 - 6x^2 - 3x^3 - 9x$$

$$18x^4 + 9x^3 - 42x^2 - 9x$$

$$-a^2(4a^2 - 5a) + 2a(3a + 6)$$

$$\boxed{-4a^4 + 5a^3 + 6a^2 + 12a}$$

For Stamps!

$$3pq(5p + 2q) - (2p^2q - 8q^2p + 1p^2)$$

$$\underline{15p^2q + 6pq^2} - \underline{2p^2q + 8q^2p} - 1p^2$$

$$\boxed{13p^2q + 14pq^2 - 1p^2}$$

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

$$\underline{5yx^3} + \underline{10xy^2} + \underline{5y^3} + \underline{4x^3y} - \underline{x^2y^2} - \underline{2xy^2} - \underline{3y^3}$$

$$\boxed{9yx^3 + 8xy^2 + 2y^3 - x^2y^2}$$

$$9yx^3 + 8xy^2 + 2y^3 - x^2y^2$$

Solving
equations

For Stamps!

$$-2(3a - 2a^2) = 4a(5 + a)$$

$$\underline{-6a + 4a^2} = \underline{20a + 4a^2}$$

$$\underline{-4a^2} \quad \underline{-4a^2}$$

$$\underline{-6a} = \underline{20a}$$

$$\underline{+6a} \quad \underline{+6a}$$

$$\underline{0} = \underline{26a}$$

$$\underline{26} \quad \underline{26}$$

$$\boxed{a = 0}$$

$$6x(x + 2) = 2(3x^2 + 12)$$

$$\underline{6x^2 + 12x} = \underline{6x^2 + 24}$$

$$\underline{-6x^2} \quad \underline{-6x^2}$$

$$\underline{12x} = \underline{24}$$

$$\underline{12} \quad \underline{12}$$

$$x = 2$$

$$2(9y + 4 - 2y) = -3(6y - 2) + 9(3 - 7y)$$

$$\underline{18y + 8} - \underline{4y} = \underline{-18y + 6} + \underline{27 - 63y}$$

$$\underline{14y + 8} = \underline{-81y + 33}$$

$$\underline{+81y} \quad \underline{+81y}$$

$$\underline{95y + 8} = \underline{33}$$

$$\underline{-8} \quad \underline{-8}$$

$$\underline{95y} = \underline{25} \quad \div 5$$

$$\underline{95} \quad \underline{95} \quad \div 5$$

$$\boxed{y = \frac{5}{19}}$$

Summary

Objective: To be able to multiply a polynomial by a monomial using distribution and exponent rules.

Virtue/Skill: Once we know how to distribute a monomial to a polynomials then we multiply any size polynomial by any size polynomial using distribution. Then we can do it backwards and factor!

Assignment: Workbook 7-5

Homework Answers 7-5:

1. $4a^2 + 3a$
2. $-11c^2 - 4c$
3. $2x^2 - 5x$
4. $2y^2 - 8y$
5. $-3n^3 - 6n^2$
6. $12h^2 - 20h$
7. $15x^3 - 3x^2 + 12x$
8. $35c - 14c^3 + 7c^4$
9. $-4b + 36b^2 + 8b^3$
10. $-30y - 6y^2 + 24y^3$
11. $4m^4 + 6m^3 - 10m^2$
12. $6n^4 - 9n^3 - 12n^2$
13. $3w^2 + 7w$
14. $5f^2 - 5f$
15. $-2p^2 + 3p$
16. $-4y^3 - y^2$
17. $3x^3 + 8x$
18. $20a^3 - 7a$
19. $-22b^2 + 2b + 8$
20. $6m^2 + 6m - 3$
21. -7
22. 4
23. -5
24. -6
25. -2
26. 1