

Your Name

Mrs. T

2/24/21

Notes

Lesson 7.3

Multiplying Polynomials by Polynomials

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

Virtue/Skill: Once we know how to distribute a binomial to a polynomial 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.

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

$$3 \cdot x \cdot x + 3 \cdot 2 \cdot x$$

Multiply Polynomials using Distribution-

Each term in the parenthesis gets multiplied with each term in the other parenthesis.

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

$$(x-1)(x+3)$$

$$x \cdot x + x \cdot 3 + -1 \cdot x + -1 \cdot 3$$

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

$$x^2 + 2x - 3$$

$$(3x+1)(2x+4)$$

$$6x^2 + 12x + 2x + 4$$

$$6x^2 + 14x + 4$$

$$(x+2)(5x+1)$$

$$x \cdot 5x + x \cdot 1 + 2 \cdot 5x + 2 \cdot 1$$

$$5x^2 + x + 10x + 2$$

$$5x^2 + 11x + 2$$

$$(x^2+2)(4x-6)$$

$$1x^2 \cdot 4x + x^2 \cdot -6 + 2 \cdot 4x + 2 \cdot -6$$

$$4x^3 - 6x^2 + 8x - 12$$

$x^2 = x \wedge 2$

Sharing is Caring! Let's each do a step!

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

$$15x^2 + -6x + -20x^3 + 8x^2$$

$$23x^2 - 6x - 20x^3$$

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

$$-4xy + -8x^3 + 2y^2 + 4x^2y$$

$$-8x^3 + 4x^2y - 4xy + 2y^2$$

$$-20x^3 + 23x^2 - 6x$$

$$(2x+5)(3xy+2y+5x)$$

$$6x^2y + 4xy + 10x^2 + 15xy + 10y + 25x$$

$$6x^2y + 19xy + 10x^2 + 10y + 25x$$

Simplifying -Distributing and combining like terms

Ex. $(x+2)(3x - 4) - 5x$



Board Work!

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



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



24.

$$\pi r^2$$

$$\pi (x+2)^2$$

$$d = 2x + 4$$

$$r = \frac{1}{2}(2x + 4)$$

$$r = x + 2$$

$$\pi (x+2)(x+2)$$

$$\pi (x^2 + 4x + 4)$$

$$\pi x^2 + 4\pi x + 4\pi$$

multiply outside term to each inside term & add exponents

$$3x(-4x-2)$$

$$3x \cdot -4x + 3x \cdot -2$$

$$-12x^2 + -6x$$

$$-12x^2 - 6x$$

multiply first term to all terms in other, then 2nd term to all terms in other

$$(3x+4)(2x-1)$$

$$6x^2 - 3x + 8x - 4$$

$$6x^2 + 5x - 4$$

$$(3x^2-4)(x+2)$$

$$3x^3 + 6x^2 - 4x - 8$$

every term gets multiplied to every term

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

$$12x^4 - 16x^3 + 20x^2 + 3x^3 - 4x^2 + 5x + 6x^2 - 8x + 10$$

$$12x^4 - 13x^3 + 22x^2 - 3x + 10$$

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 7-6

Homework Answers 7-6:

1. $m^2 + 5m + 4$
2. $x^2 + 4x + 4$
3. $b^2 + 7b + 12$
4. $t^2 + t - 12$
5. $r^2 - r - 2$
6. $z^2 - 4z - 5$
7. $3c^2 - 5c - 2$
8. $2x^2 - 18$
9. $5d^2 - 9d + 4$
10. $2l^2 - 3l - 20$
11. $3n^2 + 2n - 21$
12. $5q^2 + 24q - 5$
13. $9b^2 + 3b - 6$
14. $6m^2 - 6$
15. $8c^2 + 6c + 1$
16. $10a^2 - 19a + 6$
17. $16h^2 - 12h + 2$
18. $2x^2 - 3xy + y^2$
19. $e^3 + 7e^2 + 6e - 24$
20. $t^3 + 3t^2 + 6t + 4$
21. $k^3 + 7k^2 + 6k - 24$
22. $m^3 + 6m^2 + 14m + 15$
23. $8x^2 + 18x - 5 \text{ units}^2$
24. $x^2\pi + 4x\pi + 4\pi \text{ units}^2$

Homework Answers 7-6

Practice:

1. $(q + 6)(q + 5)$
 $q^2 + 11q + 30$

3. $(n - 4)(n - 6)$
 $n^2 - 10n + 24$

5. $(4c + 6)(c - 4)$
 $4c^2 - 10c - 24$

7. $(6a - 3)(7a - 4)$
 $42a^2 - 45a + 12$

9. $(3a - b)(2a - b)$
 $6a^2 - 5ab + b^2$

11. $(m + 5)(m^2 + 4m - 8)$
 $m^3 + 9m^2 + 12m - 40$

13. $(2h + 3)(2h^2 + 3h + 4)$
 $4h^3 + 12h^2 + 17h + 12$

15. $(3q + 2)(9q^2 - 12q + 4)$
 $27q^3 - 18q^2 - 12q + 8$

17. $(3c^2 + 2c - 1)(2c^2 + c + 9)$
 $6c^4 + 7c^3 + 27c^2 + 17c - 9$

19. $(2x^2 - 2x - 3)(2x^2 - 4x + 3)$
 $4x^4 - 12x^3 + 8x^2 + 6x - 9$

2. $(x + 7)(x + 4)$
 $x^2 + 11x + 28$

4. $(s + 5)(s - 6)$
 $s^2 - s - 30$

6. $(2x - 9)(2x + 4)$
 $4x^2 - 10x - 36$

8. $(2x - 2)(5x - 4)$
 $10x^2 - 18x + 8$

10. $(4g + 3h)(2g + 3h)$
 $8g^2 + 18gh + 9h^2$

12. $(t + 3)(t^2 + 4t + 7)$
 $t^3 + 7t^2 + 19t + 21$

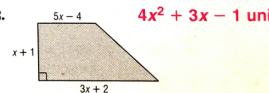
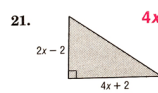
14. $(3d + 3)(2d^2 + 5d - 2)$
 $6d^3 + 21d^2 + 9d - 6$

16. $(3r + 2)(9r^2 + 6r + 4)$
 $27r^3 + 36r^2 + 24r + 8$

18. $(2\ell^2 + \ell + 3)(4\ell^2 + 2\ell - 2)$
 $8\ell^4 + 8\ell^3 + 10\ell^2 + 4\ell - 6$

20. $(3y^2 + 2y + 2)(3y^2 - 4y - 5)$
 $9y^4 - 6y^3 - 17y^2 - 18y - 10$

GEOMETRY Write an expression to represent the area of each figure.



23. **NUMBER THEORY** Let x be an even integer. What is the product of the next two consecutive even integers? $x^2 + 6x + 8$

24. **GEOMETRY** The volume of a rectangular pyramid is one third the product of the area of its base and its height. Find an expression for the volume of a rectangular pyramid whose base has an area of $3x^2 + 12x + 9$ square feet and whose height is $x + 3$ feet. $x^3 + 7x^2 + 15x + 9 \text{ feet}^3$

Homework Key: pg. 369

3. $x^2 + 4x + 3$

4. $y^2 + 10y + 24$

5. $z^2 - 2z - 15$

6. $a^2 + 5a - 24$

7. $g^2 - 9g + 14$

8. $n^2 - 10n + 24$

9. $3m^2 + 28m + 9$

10. $5s^2 - 4s - 12$

11. $x^2 + 5x + 6$

12. $y^2 + 5y - 50$

13. $h^2 - 17h + 72$

14. $c^2 - 11c + 30$

15. $12k^2 + 23k - 9$

16. $5g^2 + 43g + 24$

17. $8j^2 - 26j + 21$

18. $15d^2 - 71d + 84$

19. t also should be multiplied by $t + 5$; =
 $t^2 + 5t - 2t - 10 = t^2 + 3t - 10$

20. The 5 in the left column should be -5 ;

	$3x$	1
x	$3x^2$	x
-5	$-15x$	-5

$$(x - 5)(3x + 1) = 3x^2 - 14x - 5$$

31. $2x^2 + x - 45$

32. $p^2 - 2p - 3$

33. $\frac{1}{2}x^2 + \frac{11}{2}x + 15$

34. $x^2 - 3x + 36$

35. $x^3 + 7x^2 + 14x + 8$

36. $f^3 + 5f^2 + 12f + 8$

37. $y^3 + 11y^2 + 22y - 6$

38. $t^3 - 7t^2 + 11t - 2$

39. $-5b^3 + 15b^2 + 24b - 16$

40. $2d^3 + 11d^2 + d + 42$

41. $18e^3 - 27e^2 + 37e + 7$

42. $-30v^3 + 14v^2 + 53v - 36$