

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

Class: \_\_\_\_\_

AU7: HW# 2 – Multiplying and Factoring Polynomials

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

Use the distributive property to write an equivalent expression:

1.  $2x(3x^2 - 14x) =$

2.  $-5n^2(2n^3 - 6n) =$

3.  $4y^2(9y^3 + 8y^2 - 11) =$

4.  $-3g^7(g^4 - 6g^2 + 5) =$

Write an equivalent expression by factoring the G.C.F.:

5.  $6x - 4 =$

6.  $v^2 + 4v =$

7.  $10x^3 - 25x^2 + 20 =$

8.  $2t^2 - 10t^4 =$

9.  $15n^3 - 3n^2 + 12n =$

10.  $6p^6 + 24p^5 + 18p^3 =$

11. The length of a rectangle is represented by  $3x$ , the width is represented by  $6x^2 + 4x$ , what is the area of the rectangle? What is the perimeter?
12. The length of a rectangle is sixteen more than four times the width. What is the area of the rectangle written as a polynomial? What are the dimensions of a different rectangle with an equivalent area?

**Spiral:**

13. Solve for  $x$  in the following equation. Show your work.

$$T = (y + xw)(1 + d)$$

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AU7: Notes# 3 – Multiplying a Polynomial by a Polynomial

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

**Warm-Up:**

Use the distributive property to write an equivalent expression:

1.  $2x(x^2 + 2x - 7) =$

Multiply without a calculator:

2.  $(27)(23) =$

**Example 1: Multiplying a Binomial and a Binomial (3 Ways to Look at it)**

$(x + 3)(x + 2) =$

**Try-It! – Write an equivalent expression by multiplying:**

a.  $(x + 3)(x - 2) =$

b.  $(2x + 1)(x + 2) =$

**Practice: Write an equivalent expression by the multiplying**

3.  $(3x - 1)(2x + 1) =$

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

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

6.  $(3x - 5)(4x + 2) =$

7.  $(x + 4)(x - 4) =$

8.  $(3x - 5)(3x + 5) =$

9.  $(x + 3)(x^2 + x + 2) =$

10.  $(3x^2 - 4x - 5)(3x + 5) =$

11.  $(2x^2 + 3x - 5)(x^2 + x + 2) =$

**Example 2: Applications**

The length of a rectangle is represented by  $(x + 5)$ , the width is represented by  $6x^2 - 4x - 2$ , what is the area of the rectangle?

**Try-It!**

A rectangular prism has a length of  $(x + 5)$ , a width of  $(2x + 3)$  and a height of  $(x + 2)$ , what is the volume?

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AU7: HW# 3 – Multiplying a Polynomial by a Polynomial

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

**Directions: Simplify the following expressions.**

1.  $6k(4k + k^2) + 9k(2k - 6k^2) =$

2.  $3w(12w - 1) - 8w(12w - 1) =$

3.  $(5a + 2)(6a - 1) =$

4.  $(2x + 9)(x + 2) =$

5.  $(-2x - 1)(x + 2) =$

6.  $(2y + 5)(y - 3) =$

7.  $(2x + 4)(2x - 4) =$

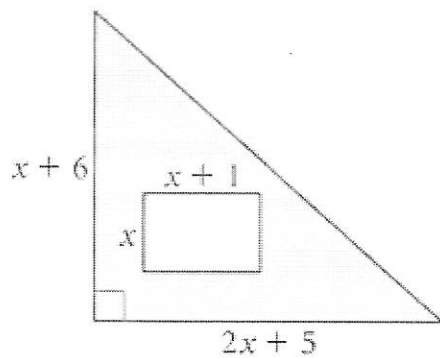
8.  $(3x - 5y)(3x + 5y) =$

9.  $(x+9)(x^2 - 4x + 1) =$

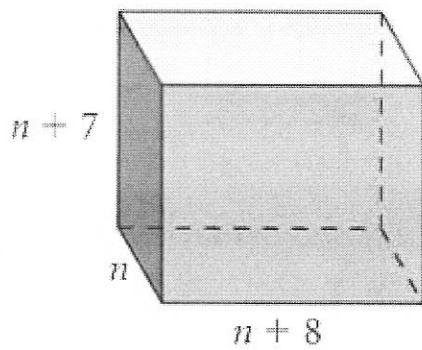
10.  $(4x^2 + x + 3)(6x - 1) =$

11.  $(6y^2 + 3y + 1)(y^2 + y + 2) =$

12. Find the area of the shaded region.



13. Find the volume of the box.



# Reteaching 9-3

## Multiplying Binomials

**OBJECTIVE:** Multiplying binomials

**MATERIALS:** None

To multiply two binomials, follow these steps:

- Multiply each term in one binomial by each term of the other binomial. Drawing arrows as a visual reminder of what to do is a helpful technique.
- Circle like terms and combine.

### Example

Find the product  $(x + 7)(x + 2)$ .

$$(x + 7)(x + 2)$$

← Draw arrows from the first term in the first binomial to both terms in the second binomial.

$$x^2 + 2x$$

← Multiply each term of the second binomial by  $x$ .

$$(x + 7)(x + 2)$$

← Draw arrows from the second term in the first binomial to both terms in the second binomial.

$$7x + 14$$

← Multiply each term of the second binomial by 7.

$$x^2 + 2x + 7x + 14$$

← Add the two expressions.

$$x^2 + \textcircled{2x} + \textcircled{7x} + 14$$

← Circle like terms and combine.

$$x^2 + 9x + 14$$

← Solution

### Exercises

Use arrows as shown above to simplify each product.

1.  $(x + 6)(x - 2)$

2.  $(x - 8)(x - 4)$

3.  $(x - 3)(x + 9)$

4.  $(x + 2)(x - 7)$

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

6.  $(x + 4)(2x + 5)$

Simplify each product.

7.  $(7x + 4)(2x - 4)$

8.  $(3x + 2)(3x + 2)$

9.  $(5x + 1)(x + 1)$

10.  $(2x + 1)(x + 1)$

11.  $(4x + 1)(2x - 1)$

12.  $(3x - 1)(x + 2)$



# Practice 9-3

## Multiplying Binomials

Find each product. Write in standard form.

- |                               |                               |                                |
|-------------------------------|-------------------------------|--------------------------------|
| 1. $(x + 3)(2x - 5)$          | 2. $(x^2 + x - 1)(x + 1)$     | 3. $(3w + 4)(2w - 1)$          |
| 4. $(x + 5)(x + 4)$           | 5. $(2b - 1)(b^2 - 3b + 4)$   | 6. $(a - 11)(a + 5)$           |
| 7. $(2g - 3)(2g^2 + g - 4)$   | 8. $(3s - 4)(s - 5)$          | 9. $(4x + 3)(x - 7)$           |
| 10. $(x + 6)(x^2 - 4x + 3)$   | 11. $(5x - 3)(4x + 2)$        | 12. $(3y + 7)(4y + 5)$         |
| 13. $(3x + 7)(x + 5)$         | 14. $(5x - 2)(x + 3)$         | 15. $(3m^2 - 7m + 8)(m - 2)$   |
| 16. $(a - 6)(a + 8)$          | 17. $(x + 2)(2x^2 - 3x + 2)$  | 18. $(a^2 + a + 1)(a - 1)$     |
| 19. $(x - 2)(x^2 + 4x + 4)$   | 20. $(2r + 1)(3r - 1)$        | 21. $(k + 4)(3k - 4)$          |
| 22. $(2n - 3)(n^2 - 2n + 5)$  | 23. $(p - 4)(2p + 3)$         | 24. $(3x + 1)(4x^2 - 2x + 1)$  |
| 25. $(2x^2 - 5x + 2)(4x - 3)$ | 26. $(x + 7)(x + 5)$          | 27. $(6x - 11)(x + 2)$         |
| 28. $(2x + 1)(4x + 3)$        | 29. $(3x + 4)(3x - 4)$        | 30. $(6x - 5)(3x + 1)$         |
| 31. $(n - 7)(n + 4)$          | 32. $(3x - 1)(2x + 1)$        | 33. $(d + 9)(d - 11)$          |
| 34. $(2x^2 + 5x - 3)(2x + 1)$ | 35. $(b + 8)(2b - 5)$         | 36. $(2x - 5)(x + 4)$          |
| 37. $(3x + 5)(5x - 7)$        | 38. $(x - 5)(2x^2 - 7x - 2)$  | 39. $(2x^2 - 9x + 11)(2x + 1)$ |
| 40. $(2x^2 + 5x - 4)(2x + 7)$ | 41. $(x^2 + 6x + 11)(3x + 5)$ | 42. $(5x + 7)(7x + 3)$         |
| 43. $(4x - 7)(2x - 5)$        | 44. $(x - 9)(3x + 5)$         | 45. $(2x - 1)(x^2 - 7x + 1)$   |

46. The width of a rectangular painting is 3 in. more than twice the height. A frame that is 2.5 in. wide goes around the painting.

- Write an expression for the combined area of the painting and frame.
- Use the expression to find the combined area when the height of the painting is 12 in.
- Use the expression to find the combined area when the height of the painting is 15 in.

47. The Robertsons put a rectangular pool with a stone walkway around it in their backyard. The total length of the pool and walkway is 3 times the total width. The walkway is 2 ft wide all around.

- Write an expression for the area of the pool.
- Find the area of the pool when the total width is 10 ft.
- Find the area of the pool when the total width is 9 ft.

48. The Cutting Edge frame shop makes a mat by cutting out the inside of a rectangular board. Use the diagram to find the length and width of the original board if the area of the mat is  $184 \text{ in}^2$ .

