

7.2 Notetaking with Vocabulary

I can multiply binomials using the distributive property.
 I can use the FOIL method.
 I can multiply binomials and polynomials.

Core Concepts - Multiplying Binomials

Multiply Binomials using the Distributive Property

a) $(x+2)(x+5)$

$$\begin{aligned}
 & x(x+2) + 5(x+2) \\
 & x^2 + 2x + 5x + 10 \\
 & x^2 + 7x + 10
 \end{aligned}$$

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

$$\begin{aligned}
 & 5(x+5) \\
 & 5x+25
 \end{aligned}$$

In Exercises 1-3, use the Distributive Property to find the product.

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

$$\begin{aligned}
 & x(x-1) + -2(x-1) \\
 & x^2 - x - 2x + 2 \\
 & x^2 - 3x + 2
 \end{aligned}$$

2. $(b-3)(b+2)$

3. $(3n-4)(n+1)$

$$\begin{aligned}
 & 3n(n+1) - 4(n+1) \\
 & 3n^2 + 3n - 4n - 4 \\
 & 3n^2 - n - 4
 \end{aligned}$$

In Exercises 4-6, use a table to find the product.

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

	x	-3
x	x^2	$-3x$
-2	$-2x$	6

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

5. $(2w-5)(w-3)$

6. $(6h-2)(-3-2h)$

	$6h$	-2
$-2h$	$-12h^2$	$4h$
-3	$-18h$	6

$$= -12h^2 - 14h + 6$$

7.2 Notetaking with Vocabulary (continued)

FOIL Method

To multiply two binomials using the FOIL Method, find the sum of the products of the

First terms, $(x+1)(x+2) \rightarrow x(x) = x^2$

Outer terms, $(x+1)(x+2) \rightarrow x(2) = 2x$

Inner terms, and $(x+1)(x+2) \rightarrow 1(x) = x$

Last terms. $(x+1)(x+2) \rightarrow 1(2) = 2$

$$\begin{matrix} \text{F} & & \text{O} \\ \swarrow & & \searrow \\ (x+1)(x+2) & = & x^2 + 2x + x + 2 = x^2 + 3x + 2 \\ \uparrow & & \swarrow \\ \text{I} & & \text{L} \end{matrix}$$

In Exercises 7–10, use the FOIL Method to find the product.

7. $(x+2)(x-3)$

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

$$x^2 - x - 6$$

8. $(2m-1)(m+2)$

9. $(4n-1)(3n+4)$

$$12n^2 + 16n - 3n - 4$$

$$12n^2 + 13n - 4$$

10. $(-q-1)(q+1)$

$$-q^2 - q - q - 1$$

$$-q^2 - 2q - 1$$

Multiplying Binomials and Trinomials (works for sizes)

Vertical Method

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

$$x^2 \cdot x^1 = x^3$$

Horizontal Method

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

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

$$x^3 - 7x^2 + 8x + 12$$

$$\begin{array}{r}
 x^2-3x-2 \\
 \cdot \quad x+5 \\
 \hline
 5x^2-15x-10 \\
 x^3-3x^2-2x+0 \\
 \hline
 x^3+2x^2-17x-10
 \end{array}$$

Box Method

$$(y+3)(y^2+8y-2)$$

	y^2	$8y$	-2
y	y^3	$8y^2$	$-2y$
3	$3y^2$	$24y$	-6

$$= y^3 + 11y^2 + 22y - 6$$

In Exercises 11–15, find the product using your choice of method.

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

12. $(h+1)(h^2-h-1)$

14. $(3n^2+2n-5)(2n+1)$

15. $(2p^2+p-3)(3p-1)$