

2.2 Multiplying Polynomials

Objective: Students will be able define a monomial, binomial, and trinomial and multiply polynomials.

Monomial: a polynomial with 1 term

examples: $f(x) = 4x$, $g(x) = x^2$

Binomial: a polynomial with 2 term

$$f(x) = x - 1, \quad g(x) = x^2 + 2$$

Trinomial: a polynomial with 3 terms

$$f(x) = x^2 - x + 5$$

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Multiplication: Simplify by distributing the monomial with the binomial.

12) $3(x+5)$
 $3x + 15$

13) $2y(y-2)$
 $2y^2 - 4y$

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

Simplify by distributing the monomial with the trinomial. Draw arrows to indicate that all terms have been distributed.

$(5)(3x^2 + 2x + 6) = 5 \cdot 3x^2 + 5 \cdot 2x + 5 \cdot 6 = 15x^2 + 10x + 30$

15) $(-3x)(-4x^2 - 10x + 12)$

$12x^3 + 30x^2 - 36x$

16) $(-2x)(11x^3 - 10x^2 + 4x + 6)$

$-22x^4 + 20x^3 - 8x^2 - 12x$

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How do we do this?

$$(a+b)(c+d)$$

$$u = a + b$$

$(x+2)(x+6)$

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

$x^2 + 8x + 12$

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

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

$x^4 + x^2 - 12$

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Simplify by distribution

16) $(9x + 7)(6x + 4)$ 17) $(6x + 3)(-5x + 2)$ 18) $(16x - 19)(8x - 8)$

$54x^2 + 36x + 42x + 28$
 $54x^2 + 78x + 28$

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Based on what you know about multiplying [polynomials](#) using the distributive property. Discover on your own how to simplify by distributing the [binomial](#) with the [trinomial](#).

19) $(2x - 3)(4x^2 + x - 6)$

$8x^3 + 2x^2 - 12x - 12x^2 - 3x + 18$
 $8x^3 - 10x^2 - 15x + 18$

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You Try.

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

$(2p - 5)(2p^2 - 3p - 7)$

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Expand

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

$(x + 4)(x + 4)$
 $x^2 + 4x + 4x + 16$
 ~~$x^2 + 4x + 4x + 16$~~
 $x^2 + 8x + 16$

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

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[Empty box for student work]

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