TOPIC: MULTIPLYING POLYNOMIALS

Multiply Polynomials by Monomials

◆ To multiply polynomials by monomials (1 term) use the distributive property:

Recall $a(b+c) = ab + ac$

EXAMPLE Use the distributive property to simplify each expression.

$(\boldsymbol{A})$ $4x(3x-7)$

$(\boldsymbol{B})$ $(y^2+3y+2)5y^2$

PRACTICE Multiply each expression.

$(\boldsymbol{A})$ $3a(5a+3b)$

$(\boldsymbol{B})$ $-x(3x^2-4x+2)$

$(\boldsymbol{C})$ $(3x^2-5x+3)2x^2$

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Multiply Binomials Using the FOIL Method

◆ Many problems involve multiplying two _____. Instead of distributing, use the FOIL method and simplify.

► FOIL is an acronym that tells you which two terms to multiply and in what order!

F.O.I.L.

Multiply F_____ terms ⇒ O_____ terms ⇒ I_____ terms ⇒ L _____ terms

Distributive Property

$x^2(x-2)$

$x^3 - 2x^2$

F.O.I.L.

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

PRACTICE Multiply the polynomials by using FOIL.

(A) $(x-5)(x-12)$

(B) $(4x+7)(-x+6)$

(C) $(x^2-3x)(2x+8)$

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EXAMPLE Multiply the polynomials by using FOIL.

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

PRACTICE Multiply the polynomials by using FOIL.

$(5xy + 3)(4xy - 2)$

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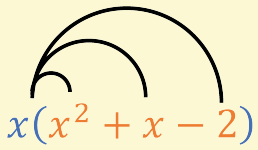
Multiply Binomials Using the Distributive Property

◆ For multiplying polynomials with > 2 terms, _____ terms of shortest expression, then _____.

Summary of Multiplying Polynomials

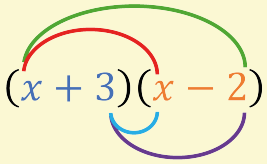
1 Term × Many Terms



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

2 Term × 2 Terms

(FOIL)



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

$$x^2 + x - 6$$

Many Terms × Many Terms

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

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PRACTICE Multiply the polynomials.

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

EXAMPLE Multiply the polynomials.

$2x(x + 3)(-5x + 7)$

PRACTICE Multiply the polynomials.

$(x + 3)(x - 5)(-2x + 1)$