PRINCIPLES - LESSON 11B
MULTIPLYING POLYNOMIALS

Recall: **Multiplying a monomial by a monomial**

Simplify.

ex1) $7a \cdot 4 = 7 \cdot 4 \cdot a = \boxed{28a}$

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ex2) $4k \cdot 3k = 4 \cdot 3 \cdot k \cdot k = \boxed{12k^2}$

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ex3) $(-3m^4n)(-1m^5n^2) = -3 \cdot -1 \cdot m^4 \cdot m^5 \cdot n \cdot n^2$

$= \boxed{3m^9n^3}$

MULTIPLYING POLYNOMIALS

We have also multiplied monomials by larger polynomials in the past.

Simplify.

ex4) $4(x+5)$ $= 4x + 20$

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ex5) $-2(2a^2 - 4a + 6)$ $= -4a^2 + 8a - 12$

MULTIPLYING POLYNOMIALS

Simplify.

ex6) $-2a(2a^2 - 4a + 6) = -4a^3 + 8a^2 - 12a$

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ex7) $5x^2(10x + 7) = 50x^3 + 35x^2$

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ex8) $3a^2b(2ab - b) = 6a^3b^2 - 3a^2b^2$

MULTIPLYING POLYNOMIALS

Simplify.

ex9) $x(x+4)$ $= x^2 + 4x$

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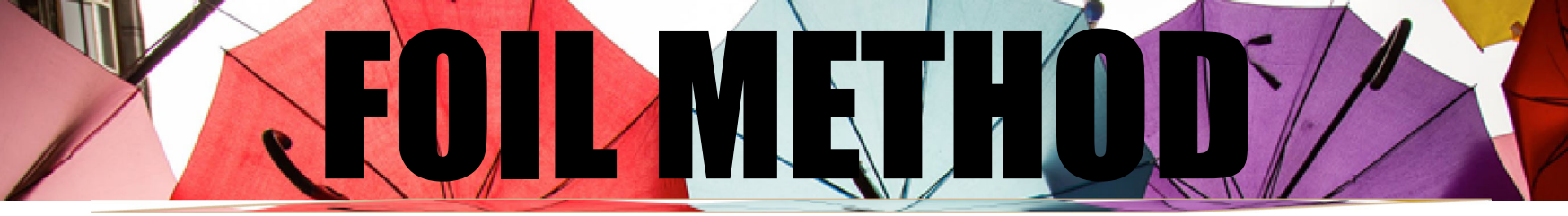
ex10) $(x+2)(x+4)$ $= x^2 + 4x + 2x + 8$

Distribute the x, then distribute the 2.

$= x^2 + 6x + 8$



FOIL METHOD

FOIL is a way to remember how to multiply two binomials together.
It is really just double distributing.

FOIL ONLY WORKS WHEN MULTIPLYING TWO BINOMIALS

First

Outside

Inside

Last

ex11) $(n+5)(n+7)$

F O I L

$= n^2 + 7n + 5n + 35$

$= \boxed{n^2 + 12n + 35}$

FOIL METHOD

Simplify.

ex12) $(a-4)(a+9)$

F O I L

$= a^2 + 9a - 4a - 36 = \boxed{a^2 + 5a - 36}$

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ex13) $(k-4)(k-1)$

F O I L

$= k^2 - 1k - 4k + 4 = \boxed{k^2 - 5k + 4}$

FOIL METHOD

Simplify.

ex14) $(2h+3)(2h-3)$

F O I L

$= 4h^2 - 6h + 6h - 9$

$= \boxed{4h^2 - 9}$

MULTIPLYING POLYNOMIALS

Simplify.

ex15) $(3y-7)^2 = (3y-7)(3y-7)$

F O I L

$= 9y^2 - 21y - 21y + 49$

$= \boxed{9y^2 - 42y + 49}$

MULTIPLYING POLYNOMIALS

Simplify.

ex16) $(r+1)(2r^2-3r+4)$

Since we are not multiplying 2 binomials, this is not FOIL. Just distribute the r and the 1.

$= 2r^3 - 3r^2 + 4r + 2r^2 - 3r + 4$

$= \boxed{2r^3 - r^2 + r + 4}$

MULTIPLYING POLYNOMIALS

Simplify.

ex17) $(a^2 - 3ab + b^2)(a + b)$

Since we are not multiplying 2 binomials, this is not FOIL. Just distribute all 3 terms of the trinomial through the binomial.

$$= a^3 + a^2b - 3a^2b - 3ab^2 + ab^2 + b^3$$

$$= \boxed{a^3 - 2a^2b - 2ab^2 + b^3}$$