9.2 Multiplying Polynomials

Double Distribute - aka -

Firsts
Outside
Inners
Lasts

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

$x^2+5x-2x-10 \Rightarrow \boxed{x^2+3x-10}$

Let's Practice!

① $(x-4)(x+7)$

$x^2+7x-4x-28$

$\boxed{x^2+3x-28}$

② $(x-4)(x+4)$ ← difference of 2 squares

$x^2+4x-4x-16$

$\boxed{x^2-16}$

~~③~~ $(2x+5)(3-2x)$

④ $(x^2+1)(x^2+2)$

$x^2 \cdot x^2 = x^4$

$x^4+2x^2+x^2+2$

x^4+3x^2+2

4th DEG. TRINOMIAL

$(a+3)(a+3)$

⑤ $(a-3)^2$

$(a-3)(a-3)$

a^2-6a+9

⑥ $(3a-b)(2a+4b)$

$6a^2+12ab-2ab-4b^2$

$\boxed{6a^2+10ab-4b^2}$

Multiplying a biomial & trinomial (name your polynomial!)

⑦ $(x^2-2)(3x^2-5x+4)$

$3x^4-5x^3+4x^2-6x^2+10x-8$

$3x^4 - 5x^3 + 4x^2 - 6x^2 + 10x - 8$

$\boxed{3x^4 - 5x^3 - 2x^2 + 10x - 8}$

4th degree polynomial

⑧ $(x+4)(2x^2 - x + 12)$

$2x^3 - x^2 + 12x + 8x^2 - 4x + 48$

$\boxed{2x^3 + 7x^2 + 8x + 48}$

cubic polynomial

Multiplying a trinomial & trinomial

⑨ $(x^2 + x - 1)(x^2 - 3x + 2)$

$\boxed{x^4 - 2x^3 - 2x^2 + 5x - 2}$

	x^2	x	-1
→ x^2	x^4,	x^3,	$-x^2$,
→ $-3x$	$-3x^3$,	$-3x^2$,	$3x$,
→ 2	$2x^2$,	$2x$,	-2,

⑩ $(2x^2 + 3x + 4)(-2x^2 + 3x - 4)$

$-4x^4 + 6x^3 - 8x^2 - 6x^3 + 9x^2 - 12x - 8x^2 + 12x - 16$

$\boxed{-4x^4 - 7x^2 - 16}$

4th degree trinomial

Challenge: Simplify!

⑪ $(3x-2)(x+1) + (x-3)$

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

$\boxed{3x^2 + 2x - 5}$

⑫ $3(a+1)(4a-5) - (7+a)$

$3(4a^2 - 5a + 4a - 5) - 7 - a$

$3(4a^2 - a - 5) - 7 - a$

$12a^2 - 3a - 15 - 7 - a$

$\boxed{12a^2 - 4a - 22}$