

FOIL

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

Annotations: FOIL (First, Outer, Inner, Last), combine like terms, 4 total terms, cancel 0x.

$$(3x-2)(3x+2) = 9x^2 + 6x - 6x - 4 = 9x^2 - 4$$

Annotations: (unsimplified solution), $3x \cdot 3x = 9x^2$, $3x \cdot 2 = 6x$, $-2 \cdot 3x = -6x$, $-2 \cdot 2 = -4$.

Difference of Two Squares (DOTS)

- subtraction
 - two terms
 - both terms are perfect squares
- Write two quantities with two blanks each (one + / one -)
 - Fill in the perfect square values in order

$$4x^2 - 9 \rightarrow (2x+3)(2x-3)$$

Annotations: $\sqrt{4x^2} = 2x$, $\sqrt{9} = 3$.

Factoring Method #2: Difference of Two Squares DOTS

$1^2 = 1$	$7^2 = 49$
$2^2 = 4$	$8^2 = 64$
$3^2 = 9$	$9^2 = 81$
$4^2 = 16$	$10^2 = 100$
$5^2 = 25$	$11^2 = 121$
$6^2 = 36$	$12^2 = 144$

- Criteria for DOTS to work:
- Must have exactly **TWO** terms ✓
 - Two terms must have a **SUBTRACTION** sign between them ✓
 - Both terms must be **PERFECT SQUARES** ✓

$$x^2 - 81 = (x-9)(x+9)$$

Annotations: $\sqrt{x^2} = x$, $\sqrt{81} = 9$, 1st term, 2nd term.

$$36x^2 - 25 = (6x+5)(6x-5)$$

Annotations: $\sqrt{36x^2} = 6x$, $\sqrt{25} = 5$.

$$9x^2 - 4 = (3x+2)(3x-2)$$

Annotations: two terms ✓, subtraction ✓, perfect squares ✓, $\sqrt{9x^2} = 3x$, $\sqrt{4} = 2$, any order.

Does Not Factor DNF

~~$$100x^2 + 121 = (10x+11)(10x+11)$$

Annotations: $\sqrt{100x^2} = 10x$, $\sqrt{121} = 11$.~~