Difference of Squares — Factor

$4x^2 - 9$

— what is the $\sqrt{4}$ + $\sqrt{9}$
$\quad\quad\quad\quad 2 \quad\quad 3$

Set up brackets

$(2 \underline{\quad\quad} 3)(2 \underline{\quad\quad} 3)$

↑
Split up
the two's

Split up
the 3's

$(2x \underline{\quad} 3)(2x \underline{\quad} 3)$

↑ split up the x's

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

one sign is positive + one negative

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

$4x^2 - 6x + 6x - 9$
$\sqrt{4} \qquad \sqrt{9}$

$4x^2 - 9$ — Difference of Squares

$(2x+3)(2x-3)$
$\sqrt{16} \qquad \sqrt{4}$

① $16x^2 - 4$ ← Binomial

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

$16x^2 - 4$

② $9x^2 - 36$
$(3x+6)(3x-6)$

③ $25x^2 - 49y^2$
$(5x + 7y)(5x - 7y)$

Expanding
FOIL
#Product

Difference of Squares $(2x+3)^2$
$(2x+3)(2x+3)$
$4x^2 + 6x + 6x + 9$
$4x^2 + 12x + 9$

$16x\cancel{+}4$ ← Cannot do
difference of squares
if the sign in between
is positive

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① take out a
common factor

$2x^2 + 8x + 6$ GCF: 2
②$(x^2 + 4x + 3)$ × 3 +4
$\quad\quad\quad\quad\quad\quad 3 \quad 1$
$2(x+3)(x+1)$

② Factor the trinomial

① take out a
common Factor

$9x^2 + 6x - 3$ GCF: 3
③$(3x^2 + 2x - 1)$ × 3 -2
$\quad\quad\quad\quad\quad\quad +3x -1x$
$3x^2 + 3x - 1x - 1$
$3x(x+1) -1(x+1)$
$3(3x-1)(x+1)$

③ Factor the trinomial

$6x^2 + 36x + 72$ GCF: 6
$6(x^2 + 6x + 12)$

$8x^2 - 24x + 18$ GCF: 2

① common
factor

②$(4x^2 - 12x + 9)$ × 36 + 12
$\quad\quad\quad\quad\quad\quad\quad -6x -6x$
$4x^2 - 6x - 6x + 9$
$2x(2x-3) - 3(2x-3)$
$2(2x-3)(2x-3)$

② Factor

bring the common →
factor down
↙
put in front
of the 2
binomials