Complex Factoring

Factoring Sum of Squares (review - remember)

$$x^2 - y^2 = (x+y)(x-y) = x^2 - xy + xy - y^2 = x^2 - y^2 \checkmark$$

$$x^2 + y^2 = x^2 - -1y^2 = x^2 - y^2 i^2 = (x+yi)(x-yi)$$

$$= x^2 - xyi + xyi - y^2 i^2$$

$$= x^2 + y^2 \checkmark$$

ex: $x^2 + 4$

$$x^2 - -1 \cdot 4 = x^2 - 4i^2 = (x+2i)(x-2i)$$

ex: $4x^2 + 25 = 4x^2 - -1 \cdot 25 = (2x+5i)(2x-5i)$

$\sqrt{4x^2} = 2x$ $\quad \sqrt{i^2} = i$ $\quad \sqrt{25} = 5$

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extra examples: $x^2 + 36$ $\qquad 9x^2 + 64$ $\qquad x^2 + 1$

$(x+6i)(x-6i)$ $\qquad (3x+8i)(3x-8i)$ $\qquad (x+i)(x-i)$