

### Co. 3

Special Products - In some cases, there are shortcuts!

Product of the sum & difference of two terms

$$(A+B)(A-B) = A^2 - B^2$$

terms must be same!

$$\textcircled{\text{ex}} (3x+4y)(3x-4y) = (3x)^2 - (4y)^2 \\ = \boxed{9x^2 - 16y^2}$$

long-way (FOIL)

$$(3x+4y)(3x-4y) = (3x)(3x) + (3x)(-4y) + (4y)(3x) + (4y)(-4y) \\ = 9x^2 - 12xy + 12xy - 16y^2 \\ = 9x^2 - 16y^2$$

Square of a binomial sum

$$(A+B)^2 = A^2 + 2AB + B^2$$

2 must be a +

$$\textcircled{\text{ex}} (5x+2)^2 = (5x)^2 + 2(5x)(2) + (2)^2 \\ = \boxed{25x^2 + 20x + 4}$$

$$\text{FOIL: } (5x+2)(5x+2) = (5x)(5x) + (5x)(2) + (2)(5x) + (2)(2) \\ = 25x^2 + 10x + 10x + 4 = 25x^2 + 20x + 4$$

Square of binomial difference

$$(A-B)^2 = A^2 - 2AB + B^2$$

$$\textcircled{\text{ex}} (x-4)^2 = x^2 - 2(x)(4) + (4)^2 \\ = \boxed{x^2 - 8x + 16}$$

$$\text{FOIL: } (x-4)(x-4) = (x)(x) + (x)(-4) + (-4)(x) + (-4)(-4) \\ = x^2 - 4x - 4x + 16 = x^2 - 8x + 16$$