

3 4A.3 Binomial Squares and Conjugates

Binomials Squares

What does $(x + 5)^2$ represent? $(x + 5)^2 = (x + 5)(x + 5)$

$$\text{Multiply } (a + b)^2 = (a + b)(a + b)$$

$$\begin{aligned} &= a(\cancel{a+b}) + b(\cancel{a+b}) \\ &= \cancel{a^2} + ab + ab + \cancel{b^2} \\ &= a^2 + 2ab + b^2 \end{aligned}$$

$$\text{Multiply } (a - b)^2 = (a - b)(a - b)$$

$$\begin{aligned} &= a(a - b) - b(a - b) \\ &= a^2 - ab - ab + \cancel{b^2} \\ &= a^2 - 2ab + b^2 \end{aligned}$$

What do you notice?

Binomials Squares:

$$\boxed{\begin{aligned} (a + b)^2 &= a^2 + 2ab + b^2 \\ (a - b)^2 &= a^2 - 2ab + b^2 \end{aligned}}$$

$$\begin{aligned} \text{Ex. } (x + 5)^2 &= (x)^2 + 2(x)(5) + (5)^2 \\ &= x^2 + 10x + 25 \end{aligned}$$

$$\begin{aligned} (b - 4)^2 &= (b)^2 - 2(b)(4) + (4)^2 \\ &= b^2 - 8b + 16 \end{aligned}$$

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

$$= 4x^2 - 12x + 9$$

$$5(3x - 4y)^2 = 5((3x)^2 - 2(3x)(4y) + (4y)^2)$$

$$= 5(9x^2 - 24xy + 16y^2)$$

$$= 45x^2 - 120xy + 80y^2$$

Perfect Square

Trinomial

Conjugates:

The conjugate of $(x + 5)$ is $(x - 5)$

$$\text{Multiply } (a+b)(a-b) = a(a-b) + b(a-b)$$

$$= a^2 - \underline{ab} + \underline{ab} - b^2$$

$$= a^2 - b^2 \text{ Difference of}$$

Squares

What do you notice?

Difference of Squares:

$$(a+b)(a-b) = a^2 - b^2$$

$$\text{Ex. } (x+5)(x-5) = x^2 - 5^2$$

$$x^2 - 25$$

$$(b-4)(b+4) =$$

$$= (b)^2 - (4)^2$$

$$= b^2 - 16$$

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

$$4x^2 - 9$$

$$5(3x+4)(3x-4) =$$

$$5((3x)^2 - (4)^2)$$

$$5(9x^2 - 16)$$

$$45x^2 - 80$$

Practice: King Kong w/s