

Do Now: Multiply the following binomials by using the tabular method:

○ a)  $(3x+2)(5x-1)$   $15x^2 + 7x - 2$

$3x+2$		
$15x^2$	$10x$	$5x$
$-3x$	$-2$	$-1$

b)  $(x-5)(x+5)$   $x^2 - 25$

$x-5$		
$x^2$	$-5x$	$x$
$5x$	$-25$	$+5$

Discovery: Analyze the products of the three different conjugate pairs. Then answer the following questions:

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

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

$(4x+1)(4x-1)$
$16x^2 - 4x + 4x - 1$
$16x^2 - 1$

c. Are your final answers trinomials or binomials?

binomials

d. What patterns do you notice when you multiply conjugate pairs together?

the middle terms cancel out

## Aim: Multiplying Conjugates

The conjugates is where we change the sign in the middle of two terms.

- It is only used in expressions with **two terms** (called "binomials"). These two terms have to be **identical** in both parentheses.

- Examples:

$(x+10)(x-10), (2x-1)(2x+1), (x+y)(x-y)$

For each given binomial expression, state its conjugate:

a)  $x^2 - 3$ ,  $x^2 + 3$

b)  $3 + x$ ,  $3 - x$

c)  $a - b^3$ ,  $a + b^3$

○ **Rule:** When multiplying conjugates, we do not have to use the tabular method. We can take a shortcut and just multiply the 1<sup>st</sup> and last terms.

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

1. Determine the following products:

a)  $(x + 7)(x - 7)$

$$x^2 - 49$$

b)  $(3x + 2)(3x - 1)$

$3x + 2$		
$9x^2$	$6x$	$3x$
$3x$	$2$	$-1$

$$9x^2 + 3x - 2$$

c)  $(x + 5)(x + 5)$

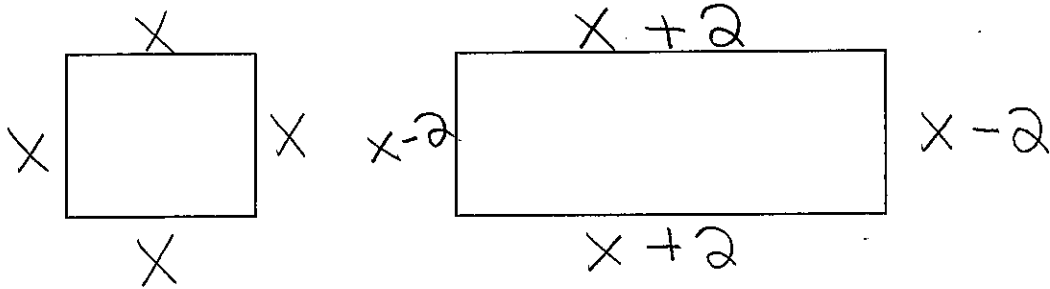
CANNOT USE  
Shortcut!  
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$x + 5$		
$x^2$	$+5x$	$x$
$5x$	$25$	$+5$

$$x^2 + 10x + 25$$

2. A square has a side length of  $x$  and a rectangle has a length represented by  $x - 2$  and a width represented by  $x + 2$ .

a) Use the information above to illustrate the problem:



b) Determine the area of both the square and the rectangle.

$$A = s^2$$

$$A = (x)^2$$

$$A = x^2$$

$$A = L \cdot w$$

$$A = (x - 2)(x + 2)$$

$$A = x^2 - 4$$

c) How much larger is the area of the square compared to the area of the rectangle?

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

The area of the square is four more than the area of the rectangle.