

## Pre-Algebra

**Aim:** How do we multiply a binomial by another binomial?

**Do Now:** Multiply.

A.  $2x(x + 5)$

B.  $3(x + 5)$

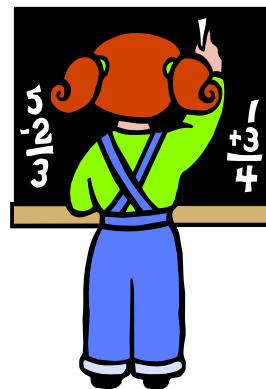
C. Based on examples A and B, how do you think you might find the product of  $(2x + 3)$  and  $(x + 5)$ ?

## Multiplying Binomials

*Think about this...*



Jillian, a 4<sup>th</sup> grade student, is asked to find the product of 23 and 42. She writes the following on the chalkboard.



$$(20 + 3) \times (40 + 2)$$

	40	2
20	800	40
3	120	6

$$800 + 40 + 120 + 6 = 966$$

Is it possible to use Jillian's method to multiply  $(2x + 3)$  and  $(x + 5)$ ?


This method is the same as \_\_\_\_\_.

Multiply each term of one polynomial by each term of the other polynomial.

$$(2x + 3)(x + 5) =$$

## Multiplying Binomials

- Use the \_\_\_\_\_ property (“Double \_\_\_\_\_”).
- Multiply each term in the first set of ( ) by each term in the second set of ( ). Add exponents of like bases.
- \_\_\_\_\_ like terms.

### Examples:

1.  $(x + 8)(x + 6)$

2.  $(x - 1)(x + 7)$

3.  $(2x - 5)(x + 3)$

4.  $(x - 11)(x + 4)$

5.  $(x + 9)(x - 2)$

6.  $(3x + 1)(x - 2)$

7.  $(b + 7)^2$

8.  $(3x + y)(2x + 2y)$

9.  $(3x^2 - 1)^2$

For #'s 10 and 11, use a diagram to multiply the binomials.

10.  $(3m^3 + 4)(3m^3 - 2)$

11.  $(x^2 - 8x)(x^2 + 8x)$

## Special Binomial Products



*Do you see a pattern?*

a)  $(x - 3)(x + 3)$

b)  $(x + 5)(x - 5)$

c)  $(7x - 4)(7x + 4)$

d)  $(9x + 1)(9x - 1)$

e)  $(b^2 + 7)(b^2 - 7)$

f)  $(3a^3 - 2)(3a^3 + 2)$

**Sum and Difference Rule:** \_\_\_\_\_

**When possible, use the sum and difference rule to multiply each pair of binomials.**

1.  $(x - 8)(x + 8)$

2.  $(x + 9)(x + 9)$

3.  $(2x + 6)(2x - 6)$

4.  $(x + 3)(x^2 - 3)$