E. Verifying a Product

After determining the product of polynomials, the product can be verified by substituting a value for the variable. If the right side of the equation is equal to the left side, the product is verified for that value of the variable. A verification does not guarantee that the two sides are equal for ALL values of the variable, but if the two sides are not equal, you'll know you've made an error.

Example 1

Numerically verify that $(5t-3)(6t-7)=30t^2-53t+21$.

Select a value to substitute for t.

This example uses $t=2$.

Left Side	Right Side
$(5t-3)(6t-7)$	$30t^2-53t+21$
$(5(2)-3)(6(2)-7)$	$30(2)^2-53(2)+21$
$(7)(5)$	$(120)-(106)+21$
35	35
LS = RS	

The left side equals the right side, so $(5t-3)(6t-7)=30t^2-53t+21$ is verified for $t=2$.

Check Up

1. Numerically verify that $(a+b)(a+b)=a^2+2ab+b^2$.

☑ Compare your answer.

1. Numerically verify that $(a+b)(a+b) = a^2 + 2ab + b^2$.

   Verifications may vary. For the chosen a and b values, the left side must equal the right side.

   This verification uses $a = 2$ and $b = 3$.

Left Side	Right Side
$(a+b)(a+b)$	$a^2 + 2ab + b^2$
$(2+3)(2+3)$	$2^2 + 2(2)(3) + 3^2$
$(5)(5)$	$4 + 12 + 9$
25	25
LS = RS	

Grid multiplication and multiplying symbolically can be used to determine the product of other polynomials as well. Before continuing with the lesson, try using one of these strategies to multiply $(x+1)(x^2+2x+3)$.

F. Multiplying Other Polynomials

The distributive property can be used to multiply any pair of polynomials. To do this, multiply each term in the first polynomial by each term in the second polynomial, and add the resulting products.

Example 1

Multiply $(x-4)(x^2+3x-5)$.

	x	-4
x^2	x^3	$-4x^2$
$3x$	$3x^2$	$-12x$
-5	$-5x$	20

$$(x-4)(x^2+3x-5) = x^3 - 4x^2 + 3x^2 - 12x - 5x + 20$$
$$= x^3 - x^2 - 17x + 20$$