

Polynomial Puzzlers!

Name: _____

Algebra 4: Polynomials

Use the following area models to figure out the missing values! Once you've done that, fill in the blanks in the **FACTORED FORM** of the equation and to the right of the equals sign, write the **POLYNOMIAL FORM**.

1. $(2x + -2)(4x + 6) = 8x^2 + 4x - 12$

	$2x$	-2
$4x$	$8x^2$	$-8x$
6	$12x$	-12

2. $(x^2 - 3x + 2)(3x^2 + -6x + 5) = 3x^4 - 15x^3 + 29x^2 - 27x + 10$

	x^2	$-3x$	2
$3x^2$	$3x^4$	$-9x^3$	$6x^2$
$-6x$	$-6x^3$	$18x^2$	$-12x$
5	$5x^2$	$-15x$	10

3. $(-6x^3 + 18x^2 - 12x + 3)(-2x^3 + 20x^2 + 6x - 1) = 12x^6 + 84x^5 - 372x^4 + 348x^3 - 150x^2 + 30x - 3$

	$-6x^3$	$18x^2$	$-12x$	3
$-2x^3$	$12x^6$	$-36x^5$	$24x^4$	$-6x^3$
$-20x^2$	$120x^5$	$-360x^4$	$240x^3$	$-60x^2$
$6x$	$-36x^4$	$108x^3$	$-72x^2$	$18x$
-1	$6x^3$	$-18x^2$	$12x$	-3

4. $(-2x^4 + 3x^3 - x^2 + 0 - 6)(x^4 - 2x^3 + x^2 + 2x + 2) = -2x^8 + 7x^7 - 9x^6 + x^5 - 5x^4 + 16x^3 - 8x^2 - 12x - 12$

	$-2x^4$	$+3x^3$	$-x^2$	0	-6
x^4	$-2x^8$	$3x^7$	$-x^6$	0	$-6x^4$
$-2x^3$	$4x^7$	$-6x^6$	$2x^5$	0	$12x^3$
x^2	$-2x^6$	$3x^5$	$-x^4$	0	$-6x^2$
$2x$	$-4x^5$	$6x^4$	$-2x^3$	0	$-12x$
2	$-4x^4$	$6x^3$	$-2x^2$	0	-12

$$5. (2x^5 - 3x^4 + x^3 - 4x^2 + 5x - 6)(6x^5 + -5x^4 + 4x^3 + -3x^2 + 2x + -1) =$$

$$12x^{10} - 28x^9 + 29x^8 - 47x^7 + 67x^6 - 88x^5 + 67x^4 - 48x^3 + 32x^2 - 17x + 6$$

	$2x^5$	$-3x^4$	x^3	$-4x^2$	$5x$	-6
$6x^5$	$12x^{10}$	$-18x^9$	$6x^8$	$-24x^7$	$30x^6$	$-36x^5$
$-5x^4$	$-10x^9$	$15x^8$	$-5x^7$	$20x^6$	$-25x^5$	$30x^4$
$4x^3$	$8x^8$	$-12x^7$	$4x^6$	$-16x^5$	$20x^4$	$-24x^3$
$-3x^2$	$-6x^7$	$9x^6$	$-3x^5$	$12x^4$	$-15x^3$	$18x^2$
$2x$	$4x^6$	$-6x^5$	$2x^4$	$-8x^3$	$10x^2$	$-12x$
-1	$-2x^5$	$3x^4$	$-x^3$	$4x^2$	$-5x$	6

$$6. (x^7 - 2x^6 + \dots + 2x^3 + 16x - 5)(-x^7 + 3x^6 + x^5 + -x^4 + \dots + \dots) =$$

$$-x^{14} + 5x^{13} - 11x^{12} + 14x^{11} - 12x^{10} + 19x^9 - 50x^8 + 93x^7 - 105x^6 + 59x^5 - 20x^4 + 61x^3 - 67x^2 + 101x - 30$$

	x^7	$-2x^6$	x^5	$-x^4$	$2x^3$	$-6x^2$	$16x$	-5
$-x^7$	$-x^{14}$	$2x^{13}$	$-x^{12}$	x^{11}	$-2x^{10}$	$6x^9$	$-16x^8$	$5x^7$
$3x^6$	$3x^{13}$	$-6x^{12}$	$3x^{11}$	$-3x^{10}$	$6x^9$	$-18x^8$	$48x^7$	$-15x^6$
$-4x^5$	$-4x^{12}$	$8x^{11}$	$-4x^{10}$	$4x^9$	$-8x^8$	$24x^7$	$-64x^6$	$20x^5$
$2x^4$	$2x^{11}$	$-4x^{10}$	$2x^9$	$-2x^8$	$4x^7$	$-12x^6$	$32x^5$	$-10x^4$
x^3	x^{10}	$-2x^9$	x^8	$-x^7$	$2x^6$	$-6x^5$	$16x^4$	$-5x^3$
$3x^2$	$3x^9$	$-6x^8$	$3x^7$	$-3x^6$	$6x^5$	$-18x^4$	$48x^3$	$-15x^2$
$-x$	$-x^8$	$2x^7$	$-x^6$	x^5	$-2x^3$	$6x^3$	$-16x$	5
6	$6x^7$	$-12x^6$	$6x^5$	$-6x^4$	$12x^3$	$-36x^2$	$96x$	-30