Warm-up 1-21

Simplify each expression, then name the polynomial.

1. $(2x + 3xy – 7y) + (4x + 13y + 4x)$

2. $(2m^2 – 3n + 4 + 7n^3m^2) – (6n – 9m^2 + 5n^3 – 1)$

Warm-up 1-21

Simplify each expression, then name the polynomial.

1. $(2x + 3xy - 7y) + (4x + 13y + 4x)$

$2x + 3xy - 7y + 4x + 13y + 4x$

$10x + 3xy + 6y$

$3xy + 10x + 6y$

Quadratic Trinomial

2. $(2m^2 - 3n + 4 + 7n^3m^2) - (6n - 9m^2 + 5n^3 - 1)$

$2m^2 - 3n + 4 + 7n^3m^2 - 6n + 9m^2 - 5n^3 + 1$

$2m^2 - 3n + 4 + 7n^3m^2 - 5n^3$
$+ 9m^2 - 6n + 1$

$11m^2 - 9n + 5 + 7n^3m^2 - 5n^3$

$7n^3m^2 - 5n^3 + 11m^2 - 9n + 5$

Quintic Polynomial

	Name by Degree
0	Constant
1	Linear
2	Quadratic
3	Cubic
4	Quartic
5	Quintic
6	Degree of 6

Today's Goal

I can

- multiply monomial and polynomial expressions using the distributive method
- multiply 2 binomials using the ~~FOIL method~~, distributive, rectangle, and vertical method

Section 8.3: Multiplying Polynomials

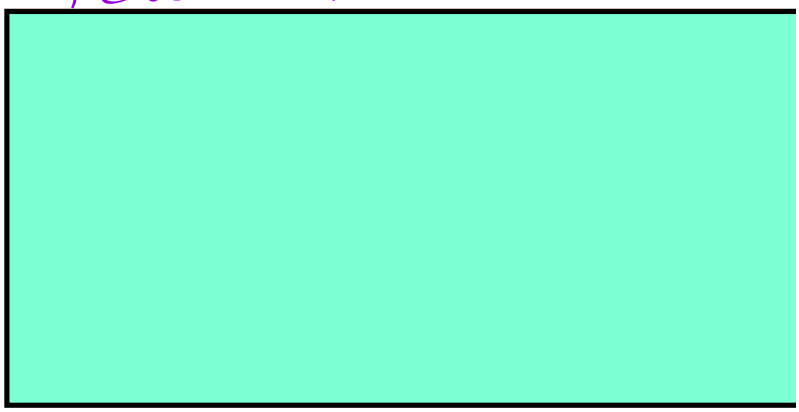
Review of Exponent Rules:

*Product

$x^n x^m = x^{n+m}$

$x^2 x^4 = x^6$

Power $(x^n)^m = x^{nm}$



Examples:

$3m^3p(-10mp)$

$-30m^3mpp$

$-30m^4p^2$

$-12x^5y^2(2xy)(-3x^2y)$

$72x^5xx^2y^2yy$

$72x^8y^4$

Monomial times a Polynomial

- **Distributive Property**

$a(b+c) = ab + ac$

Examples:

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

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

$3x^2 - 3x + 12$

2. $4x^2(6x^3 + x)$

$4x^2(6x^3) + 4x^2(x^1)$

$24x^5 + 4x^3$

3. $3xy^2(10x + 11y^2 + 14)$

$3x^1y^2(10x^1) + 3xy^2(11y^2) + 3xy^2(14)$

$30x^2y^2 + 33xy^4 + 42xy^2$

$33xy^4 + 30x^2y^2 + 42xy^2$

Try These!!!

1. $-6x^2 (3x + 10)$

2. $15xy (3x^2y + 11x^2)$

3. $-178x(2xy + 10x - 3)$

Try These!!!

1. $-6x^2(3x + 10)$

$-6x^2(3x) + -6x^2(10)$

$-18x^3 - 60x^2$

2. $15xy(3x^2y + 11x^2)$

$15xy(3x^2y) + 5xy(11x^2)$

$45x^3y^2 + 165x^3y$

3. $-178x(2xy + 10x - 3)$

$-178x(2xy) + -178x(10x) + -178x(-3)$

$-356x^2y - 1780x^2 + 534x$

Section 8.3b: Multiplying Polynomials

Distributive Method

$(5x + 3)(2x^2 + 10x)$

$5x \cdot 2x^2 + 5x \cdot 10x$

$2x^2(5x) + 2x^2(3) + 10x(5x) + 10x(3)$

$10x^3 + 6x^2 + 50x^2 + 30x$

$10x^3 + 56x^2 + 30x$

Section 8.3b: Multiplying Polynomials

Distributive Method

$(3x + 4)(x^2 + 8x - 12)$

$x^2(3x+4) + 8x(3x+4) + -12(3x+4)$

$x^2(3x) + x^2(4) + 8x(3x) + 8x(4) + -12(3x) + -12(4)$

$3x^3 + 4x^2 + 24x^2 + 32x - 36x - 48$

$3x^3 + 28x^2 - 4x - 48$

Section 8.3b: Multiplying Polynomials

Distributive Method (Your turn)

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

Section 8.3b: Multiplying Polynomials

Distributive Method

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

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

$$2x^3 - 3x^2 + 10x^2 - 15x + -4x + 6$$

$$2x^3 + 7x^2 - 19x + 6$$

Rectangle Method

$(5x + 3)(10x - 6)$

	$10x$	-6
$5x$	$5x(10x)$	$5x(-6)$
3	$3(10x)$	$3(-6)$

$50x^2 - 30x + 30x - 18$

$50x^2 - 18$

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

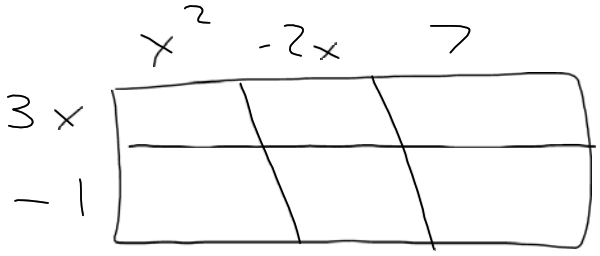
	x	-3
x	$x(x)$	$x(-3)$
5	$5(x)$	$5(-3)$

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

$x^2 + 2x - 15$

Rectangle Method (your turn)

$$(3x - 1)(x^2 - 2x + 7)$$



Rectangle Method

$$(3x - 1)(x^2 - 2x + 7)$$

	x^2	$-2x$	$+7$
$3x$	$3x^3$	$-6x^2$	$21x$
-1	$-x^2$	$2x$	-7

$3x^3 - 6x^2 + 21x - x^2 + 2x - 7$

$3x^3 - 7x^2 + 23x - 7$

Vertical Method

(5x + 3) (10x - 6)

$$\begin{array}{r} 5x+3 \\ 10x-6 \\ \hline -30x \quad -18 \\ 50x^2+30x \\ \hline 50x^2-18 \end{array}$$

$$\begin{array}{r} 127 \\ \times\ 12 \\ \hline \end{array}$$

(x + 5) (x - 3)

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

$$\begin{array}{r} x^2-4x+3 \\ x+2 \\ \hline 2x^2-8x+6 \\ x^3-4x^2+3x \quad 0 \\ \hline x^3-2x^2-5x+6 \end{array}$$

More Examples of each Method

$$(x - 5)(x^2 + 4x - 6)$$

More Examples of each Method

Distributive Method

$(x - 5)(x^2 + 4x - 6)$

Rectangle Method

$(x - 5)(x^2 + 4x - 6)$

Vertical Method

$(x - 5)(x^2 + 4x - 6)$

More Examples of each Method

Distributive Method

$(x - 5)(x^2 + 4x - 6)$

$(x-5)x^2 + (x-5)4x + (x-5)(-6)$

$x^2(x) + x^2(-5) + 4x(x) + 4x(-5) + (-6)(x) + (-6)(-5)$

$x^3 - 5x^2 + 4x^2 - 20x - 6x + 30$

$x^3 - x^2 - 26x + 30$

Rectangle Method

$(x - 5)(x^2 + 4x - 6)$

	x^2	$4x$	-6
x	x^3	$4x^2$	$-6x$
-5	$-5x^2$	$-20x$	30

$x^3 + 4x^2 - 6x - 5x^2 - 20x + 30$

$x^3 - x^2 - 26x + 30$

Vertical Method

$(x - 5)(x^2 + 4x - 6)$

$$\begin{array}{r} x^2 + 4x - 6 \\ \times \quad x - 5 \\ \hline -5x^2 - 20x + 30 \\ x^3 + 4x^2 - 6x \quad 0 \\ \hline x^3 - x^2 - 26x + 30 \end{array}$$

Use the method of your choice to multiply

$$(3x + 4)(x^2 - 2x - 7)$$

$3x^3 - 6x^2 + 4x^2 - 21x - 8x - 28$

$3x^3 - 2x^2 - 29x - 28$

Homework

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