Warm-up 2-1

Classify the following expressions (give the degree and number of terms), write each one in standard form, and give the leading coefficient.

1. $14xyz^2 + 3x^7y^2 - 16$

2. $8 + k + 5k^4$

3. $5h^2 - 3h^3$

4. $9a^8 - 8a^9$

5. $3c^2 + 5c^4 + 5c^3 - 4$

Warm-up 2-1

Classify the following expressions (give the degree and number of terms), write each one in standard form, and give the leading coefficient.

1. $14xyz^2 + 3x^7y^2 - 16$ $3x^7y^2 + 14xyz^2 - 16$ Degree of 9 Trinomial

2. $8 + k + 5k^4$ $5k^4 + k + 8$ Quartic Trinomial

3. $5h^2 - 3h^3$ $-3h^3 + 5h^2$ Cubic Binomial

4. $9a^8 - 8a^9$ $-8a^9 + 9a^8$ Degree of 9 Binomial

5. $3c^2 + 5c^4 + 5c^3 - 4$ $5c^4 + 5c^3 + 3c^2 - 4$ Quartic Polynomial

Classifying Polynomials

Name by Degree	Degree	*Examples*	Number of Terms	Name by Terms
Constant	0	36	1	monomial
Linear	1	14x + 2	2	binomial
Quadratic	2	$2x^2 + 3x - 1$	3	trinomial
Cubic	3	$m^3 - 5$	2	binomial
Quartic	4	$8k^4+5k^2-k+1$	4	polynomial
Quintic	5	$-9r^5+5r^3-7r^2+r+3$	5	polynomial
Degree of 6	6	$x^6 - 7x + 13$	3	trinomial

Examples

$x^2 + 2x + 3 + 7x$

Quadratic Polynomial

$x^2 + 9x + 3$

$3c^2 + 5c^4 + 5c^3 - 4$

Quartic Polynomial

Try These!!!

Classify the polynomials below according to its degree and number of terms.

9. $4x^2 + 5x - 3$

10. $84x^4y^3 - 3x^2y^2$

Try These!!!

Put the polynomial in standard form and then classify the polynomials below according to its degree and number of terms.

10. $5x - 6$

11. $15y - 84y^3 + 100 - 3y^2$

12. $7a^3b^4 - 2a^4 + 4b - 15$

Try These!!!

Put the polynomial in standard form and then classify the polynomials below according to its degree and number of terms.

10. 5x - 6

$$5x - 6 \qquad Linear \ Binomial$$

11. $15y - 84y^3 + 100 - 3y^2$

$$-84y^3 - 3y^2 + 15y + 100 \qquad Cubic \ Polynomial$$

12. $7a^3b^4 - 2a^4 + 4b - 15$

$$7a^3b^4 - 2a^4 + 4b - 15 \qquad Degree \ of \ 7 \ Polynomial$$
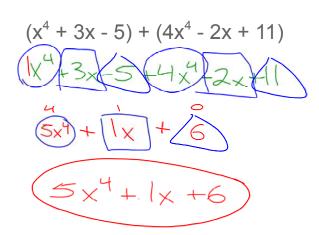
Today's Goal

I can
- add polynomials
- subtract polynomials
- simplify polynomials

Section 8.2a: Adding Polynomials

 * Polynomial + Polynomial = Polynomial

Example:

$(x^4 + 3x - 5) + (4x^4 - 2x + 11)$

$1x^4 + 3x - 5 + 4x^4 - 2x + 11$

$5x^4 + 1x + 6$

$5x^4 + .1x + 6$

Horizontal Method

Step 1: Rewrite with out parenthesis

Step 2: Identify like terms (use shapes
 to help see the common terms)

Step 3: Combine like terms

Step 4: Write answer in standard form

$(4b^5 + 8b) + (3b^5 + 6b - 7b^5 + b - 3)$

~~$4b^5 + 8b + 3b^5 + 6b - 7b^5 + b - 3$~~

Step #1: Rewrite the problem without parentheses

$4b^5 + 8b$
$3b^5 \quad +6b$
$-7b^5 \quad +b \quad -3$
_____
$0b^5 + 15b - 3$

$\boxed{15b - 3}$

Step #2: Align like terms vertically (if a term does not have a like term use a 0 as a place holder)

$2x^2 - 4x + 4 - 2x^2 - 5x + 4$

$-9x + 8$

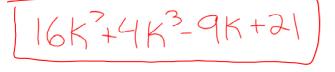**Step #3**: Add

Step 4: Write answer in standard form

More Examples

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

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

$(3y^3 + 2x^2 - 7y + x + 14) + (-5x^3 + 8x^2 + 15y + 2)$

$3y^3 - 5x^3 + 10x^2 + 8y + x + 16$

$(16k^7 - 4k^3 - 10k + 21) + (8k^3 + k)$

$16k^7 + 4k^3 - 9k + 21$

Try these!!

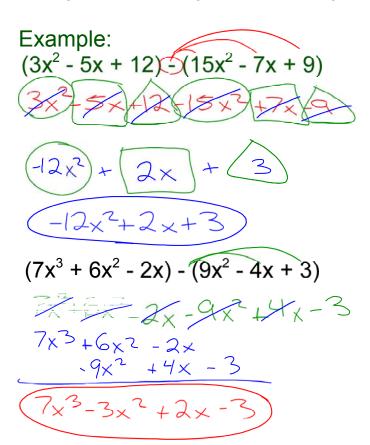1. $(-5m^5 + 6n - 21m) + (-10m + 15m^5 - 12n)$

2. $(-8m - 2) + (8m - 10)$

3. $(24xy + 3x - 21y + 3) + (13xy + 7y - 9x - 3)$

Try these!!

1. $(-5m^5 + 6n - 21m) + (-10m + 15m^5 - 12n)$

$-5m^5 + 6n - 21m - 10m + 15m^5 - 12n$

$10m^5 - 31m - 6n$

2. $(-8m - 2) + (8m - 10)$

$-8m - 2 + 8m - 10$

-12

3. $(24xy + 3x - 21y + 3) + (13xy + 7y - 9x - 3)$

$24xy + 3x - 21y + 3 + 13xy + 7y - 9x - 3$

$37xy - 6x - 14y$

Section 8.2b: Subtracting Polynomials

* Polynomial - Polynomial = Polynomial

Example:

$(3x^2 - 5x + 12) - (15x^2 - 7x + 9)$

$3x^2 - 5x + 12 - 15x^2 + 7x - 9$

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

$-12x^2 + 2x + 3$

$(7x^3 + 6x^2 - 2x) - (9x^2 - 4x + 3)$

$7x^3 + 6x^2 - 2x - 9x^2 + 4x - 3$

$7x^3 + 6x^2 - 2x$
$-9x^2 + 4x - 3$
$\overline{}$
$7x^3 - 3x^2 + 2x - 3$

Step 1: Rewrite the first polynomial without the parenthesis

Step 2: Distribute the negative to the second Polynomial

Step 3: Identify like terms (use shapes)

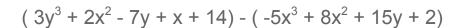**Step 4:** Combine like terms

Step 5: Write the answer in standard form

More Examples:

$(16k^7 - 4k^3 - 10k + 21) - (8k^3 + k)$

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

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

$(3y^3 + 2x^2 - 7y + x + 14) - (-5x^3 + 8x^2 + 15y + 2)$

Try these!!

1. $(-5m^5 - 6n - 21m) - (-10m + 15m^5 - 12n)$

2. $(-8m - 2) - (8m + 10)$

3. $(4xy + 3x - 2y + 3) - (-3xy + 7y - 9x - 3)$

Try these!!

1. $(-5m^5 - 6n - 21m) - (-10m + 15m^5 - 12n)$

   $-20m^5 + 6n - 11m$

2. $(-8m - 2) - (8m + 10)$

   $-16m - 12$

3. $(4xy + 3x - 2y + 3) - (-3xy + 7y - 9x - 3)$

   $7xy + 12x - 9y + 6$

Homework

pg. 409 #1-3, 20-25

pg. 417 #1-19 (odd)